AUGUST 25, 1924

THE RUBBER AGE

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The Only Twice-a-Month Rubber Publication

VOL. XV. AUGUST 25, 1924 No. 10

BRITISH NOT OBLIGED TO LOSE ON RUBBER

So Says Winston Churchill Ironically in Speaking on British Restriction at Dinner of Malayan Planters in London—Outlines General View.

(Special to THE RUBBER AGE*)*

The Rt. Hon. Winston Churchill, who, when Colonial Secretary in the British Government, initiated the Stevenson Restriction Scheme, was the principal guest at the first annual dinner of the Incorporated Society of Planters of Malaya, held in London on July 19. In his speech Mr. Churchill gave an intelligent version of the British point of view regarding the scheme and at the conclusion received a tremendous ovation. Brief details of the outstanding points he made are given hereunder.

Recommended Plan to Cabinet

During the latter part of Mr. Churchill's official career he was called upon, as Colonial Secretary, to examine the situation of the rubber industry, and, with the aid of Lord Stevenson (who has recently been rewarded with a peerage for his public services, and whom Mr. Churchill described as "an extraordinarily clever, far-seeing business man") he took the responsibility of recommending to the Cabinet the rubber restriction scheme. He hoped that the scheme had helped the industry to turn the corner, but felt very strongly that a great industry like the rubber industry, in which one hundred to one hundred and fifty millions of British capital ($500,000,000-750,000,000) had been invested, required the constant attention and support of the Colonial Office. A great number of those engaged in the industry are in the Federated Malay States, where it is so largely located. It is one of Britain's most convenient methods, and one of her only remaining methods of paying the debts she has promised to pay to the United States.

"On the one hand," continued Mr. Churchill, "our American friends have demanded the uttermost farthing of the debt which we incurred on behalf of our Allies during the great struggle, and on the other they have, by another branch of their policy, erected enormous barriers of tariffs which prevent, so far as possible, the payment of a debt which the Legislature, in its other mood, has so strongly demanded. I have always felt that, however severely one may judge our obligations, we are under no obligation to supply our American friends with rubber at a loss."

The extraordinary fluctuations in the price of rubber, which has risen as high as 12/6 ($3) and fallen as low as 5d (10c), confront planters with the most difficult problems in the administration of their estates. The restriction scheme was not embarked upon with the idea of raising prices or of restricting the permanent growth of rubber production throughout the world, but the idea of providing stability. The figure Malayan planters had in mind as being the figure at which there was a fair profit to the producer was 1/3 (normally 30c). That has not been realized, and whether it will be under the agency of the present scheme it is impossible to forecast. Possibly some selling arrangement is necessary, but on that Mr. Churchill would not pronounce. The idea is that the Empire is entitled to obtain a reasonable and fair margin of profit on its rubber production, and it is the duty of the British Government, in so far as their intervention may be useful or necessary, to facilitate the arrival of such a conclusion. Whatever else the scheme has done, it has enabled the Society of Malayan Planters to come together in an effective manner so that the planters can speak with a united voice.

At the conclusion of Mr. Churchill's speech, G. L. O'Hara Hickson, the chairman, responding said that if the Dutch had come into the scheme instead of feathering their own nest the industry would be in a much better position today.

STEVENSON PLAN CUTS RUBBER EXPORTS

The exportable allowance of crude rubber from British controlled plantation areas has been officially reduced from 60 per cent of the 1920 production to 55 per cent for the quarter beginning Aug. 1. This is in accordance with the provision of the Stevenson plan, which also provides for further reductions of 5 per cent for each succeeding quarter if the price of the commodity is not maintained at an average of one shilling six pence.

RUBBER INDUSTRY IN HEALTHY CONDITION

Many Companies Report Increased Production—General and India at Capacity—Executives Report Better and Sounder Conditions in the Industry.

Production has increased and financial conditions in the rubber industry have shown marked improvement according to statements of executives in Akron factories made to a representative of THE RUBBER AGE. The last two months have seen the factories of Akron in full time operation to keep up to the consumers' demand for tires. Several factories report that they have had difficulty in securing a sufficient number of skilled workmen to carry on the work, but in most cases the increased business has merely meant steady work for regular employees.

Report Production Increases

At Goodrich, Goodyear, Firestone, Miller, General, Mohawk, Swinehart, Amazon, Star and the American Rubber & Tire Co. it was reported that tire production was on the increase while equally optimistic news came from the Seiberling Rubber Co. of Barberton and from the Falls Rubber Co. and the Eclat Rubber Co. at Cuyahoga Falls. The Eclat Rubber Co. produces most of the radiator hose used in this country.

The General Tire Co. of Akron and the India Tire Co. of Mogadore are two outstanding examples of what good business practice can do in the rubber industry. Though not the largest companies in the Akron district, both factories are enjoying capacity production and stand among only three rubber companies of America that have never missed yielding a dividend. In most cases three shifts are operated, but it has been the General's policy to work in but two shifts.

While none of the officials interviewed desired to pose as seers they were unanimous in saying that the leaders in the rubber industry were slowly but surely working toward a sound and practical foundation. Unit sales, they declare, are larger than at any time since the war, although repeated cuts in the price of tires have naturally narrowed the resulting margin of profit.

(Continued on Page 374)

RUBBER INDUSTRY IN HEALTHY CONDITION

(Continued from Page 373)

While there has been an unusual demand for the new balloon tire, the production of low pressure tires amounts to no more than 20 per cent of the total production at one of the larger factories, according to a sales executive who says that the demand for regular high pressure tires constitutes the bulk of their business.

Employment conditions have improved in the past year, although it is true that overhead in many of the larger Akron factories has been reduced by cutting down the number of employees especially in the offices. Replying to the complaint of certain Akron merchants that business was dull because of conditions in the rubber factories, a prominent official pointed out that the retail business could no longer expect to operate at "peak prices" in the face of the readjustment.

No official could be found who was willing to be quoted concerning tire prices and whether they could be expected to rise or continue to fall. At Firestone, however, it was claimed that tire prices advance or decline in sympathy with the movement in the price of crude rubber. For example, in September, 1922, crude rubber was quoted at 13 cents a pound. In November of the same year, when the British rubber restriction act limited exportations to 60 per cent of the standard yield as calculated on the standard of production for the year ending Nov. 1, 1920, crude rubber steadily advanced until it sold for 37 cents a pound in January, 1923.

Then came advances in tire prices. In March, 1923, the government appropriated half a million dollars for the purpose of seeking independent sources of rubber supply at the instigation of H. S. Firestone, and almost immediately came a decline in the prices of raw material and a subsequent drop in the price of tires.

In many parts of the country Mr. Firestone's persistent campaign against British rubber restriction legislation is credited with having saved American rubber consumers millions of dollars. Nearly everyone in the industry agrees that conditions are much better and far more sound.

McLean Property Appraised

A report of the appraisement of the property and chattels of the McLean Tire & Rubber Co. of East Liverpool was recently filed in court at Lisbon this week, in the case of W. B. Davis of Cleveland against the company. The appraisers were: F. H. Grove of East Palestine, R. L. Cawood and James S. Hilbert of East Liverpool.

The land owned by the company was valued at $5000, the buildings and equipment at $118,745, raw materials, goods in process of manufacture, work supplies and manufactured products, $2,982,24. Some merchandise owned by the company, stored in the Milliron warehouse in East Liverpool, has been valued at $30.

VALUE OF TIRE DOLLAR ADVANCES 30 PER CENT

The dollar today buys $1.30 worth of tire as compared with the pre-war dollar, say officials of the Firestone Tire & Rubber Co. Comparing the value today with the figure prevailing in March, 1923, the dollar actually buys $1.55 worth of tire. The automobile dollar has set a purchasing standard of about $1.11 as against value in 1913.

Hammond Rubber Co. Formed

The Hammond Rubber Co., with a capitalization of $10,000 has been formed by S. W. Hammond and will locate in Massillon, Ohio. Operations are expected to begin shortly in a part of the Justus Plumbing Co. building on Clay St. where workmen are now preparing a plant. The plant will manufacture toy balloons until business warrants undertaking the manufacture of bathing novelties and electricians' gloves. Between 300 and 350 gross of toy balloons a day will be manufactured at the start.

S. W. Hammond has been associated with the rubber trade in various capacities for 16 years. In 1908 he learned the cultivation of rubber in the Federated Malay States. Later he went to Singapore and subsequently became a rubber broker. Afterward he went to England and finally came to America where he became crude rubber broker for the Firestone Tire & Rubber Co. He was sent to England later by the Firestone company to assist in establishing a crude rubber department.

May Remove Jersey City Plant

A factory of the United States Rubber Co. at Fisher Ave. and North Bergen St., Jersey City, N. J., may be removed due to the failure of a device said to have cost $20,000 for making the manufacture of rubber products odorless. The apparatus, which was installed on orders of the Board of Health to eliminate the odors of the plant, has proved only a partial success. Renewed efforts will be made to get the odor-eliminating machinery to function better but if these fail, the company will remove the plant and use the building for other purposes.

Panther Rubber Reopens

The factory of the Panther Rubber Co., Stoughton, Mass. which shut down recently following a strike of employees caused by reduction in wages was reopened four days later. Except in the pressing room the plant reopened with a full complement of hands. Conferences between the pressmen and officials came to no satisfactory conclusion and none of the old pressmen, it was stated, returned to work. However, after a few days new pressmen were hired and the factory is now running with a full force.

STUDY OF PARTICLE SIZES OF FILLERS COMPLETED

A study of the size and character of grains of non-metallic mineral fillers has been completed by the Department of the Interior at the Southern Experiment Station of the Bureau of Mines, Birmingham-Tuscaloosa, Alabama. Mineral fillers are those non-metallic minerals that, after being pulverized, are used in the preparation of various manufactured articles. Kaolin, whiting, chalk, ground limestone and marble, silica, ocher, mica, talc, barite, slate flour, graphite, and diatomaceous earth are the chief mineral fillers. Different forms of some of these minerals are employed; as, for example, silica may be ground quartz, or pumice, or tripoli, the fine grounded grains resulting from the weathering of chert.

Each mineral has properties that make it suitable for certain uses. These properties are color, specific gravity, the nature of the surface, and the shape and, probably of greatest importance, the size of the particles. Most fillers are used essentially as inert substances to occupy space, fill voids, or impart color, but in some lines of manufacture they have an important but not easily understood effect on the physical properties of the finished article. For example, ground barite and marble, aside from their specific gravity, have particles that are much alike in appearance and shape, and yet the properties they impart to a rubber compound are quite different. Of chief importance in the comparison of fillers from the same mineral, and to a less degree of fillers from different minerals, are the average particle size, the variation in size from maximum to minimum, and the proportionate amounts of the different sizes; the shape of the grains ranks second and applies more especially to the comparison of fillers from different minerals.

Details of methods of determining the average particle size and proportions of grains of different sizes are given in Technical Paper 296, by W. M. Weigel, mineral technologist, copies of which may be obtained from the Department of the Interior, Bureau of Mines, Washington, D. C.

U. S. Reopens Four Plants

Operations were resumed early in August at the plants of the United States Rubber Co. at Woonsocket and Millville, R. I., after a shutdown of five weeks. About 1,800 hands were taken back. The wire plant of the National India Rubber Mill, also a subsidiary of the United States Rubber Co. at Bristol, R. I., will resume operations soon.

The footwear departments of the Goodyear India Rubber Shoe Co. and the Goodyear Metallic Rubber Shoe Co., subsidiaries of the U. S. company at Naugatuck, Conn. opened Aug. 4. The factories had been closed for the usual summer shutdown period of five weeks. The sundries department was kept in operation. With the regular working force of 800 men the schedule will be fifty-five hours weekly.

INCREASED PRODUCTION HELPING EMPLOYMENT

Goodyear, Firestone and Miller Add Men to Maintain New Production Schedules —Goodrich Maintaining an Output of 20,000 Tires a Day, Says Rutherford.

Increases in production at Akron rubber factories during the past few weeks together with anticipated further increases have resulted in additions to working forces, it was learned recently. Practically all of the factories reported that they are either maintaining their level of production during the summer months or gradually increasing their outputs to meet growing demands for tires.

Additional builders and finishers have been hired by the Goodyear, Goodrich and Firestone companies. The Miller Rubber Co. has also been hiring workers in various departments.

Most of the new men being hired at the Goodyear plant are going into the tire room, officials said. William O. Rutherford, vice president in charge of sales for the B. F. Goodrich Co., said that their plant was not increasing production at this time but is maintaining a production schedule of 20,000 tires a day. Additional men hired were taken on to fill vacancies, it was said.

"We are running on an even load the year around and whatever increase has been made is only local," Mr. Rutherford stated.

Converse Rubber Profits Drop

The financial statement of the Converse Rubber Shoe Co., Malden, Mass., recently issued for the fiscal year ended March 31 shows a loss in net profits of $116,367 over the previous year. Net profits are $382,310 against $498,677. Although sales dropped off $1,490,925, they are far above those of 1921. Sales for the year ended March 31, 1924 are $4,255,951 against $5,746 in 1923 and $3,317,488 in 1921.

Asks for Audit of Paul Rubber

The state auditor's office at Raleigh, N. C., has received a letter from John J. George requesting that the books of the defunct Paul Rubber Co., Salisbury, N. C. be again investigated under state supervision and if irregularities are found that the guilty parties be prosecuted. The letter states that the request is the desire of the stockholders and creditors of the company whose license was recently revoked by the state insurance department after the books had been examined.

The matter was referred to the insurance department where it was said that an investigation was being carried on of the sale of $500,000 worth of stock in North Carolina. It was stated at the insurance department that a supervision of the auditing of the books would be undertaken if requested by all the creditors and stockholders.

RUBBER BEARINGS MAY REPLACE METAL ONES

Predicting that the employment of rubber for new uses would eventually surpass its use in tires, W. A. Johnson, manager of tire sales for the B. F. Goodrich Co. at a recent meeting of the Exchange Club in Akron, declared that one of the latest uses is for bearings which may replace those of babbit now in common use.

He exhibited a rubber bearing taken from a propeller shaft of a vessel and said that it had been found successful. He declared that it is possible that rubber bearings for motors will soon be developed.

Pease Sundry Co. Formed

A new sundry jobbing company has been formed at Los Angeles, Calif., headed by A. V. Pease. Temporary offices are located at 406 Equitable Bldg., Los Angeles, Calif. The company will specialize in sundry merchandise, including rubber goods saleable to the drug, sporting goods, stationery and dry goods buyers on the Pacific Coast. The Pease Sundry Co. will be glad to have eastern manufacturers offer their merchandise for sale in the territory it covers. Credit reference is the Citizens National Bank, Los Angeles.

Ajax Earnings Reported

A sharp decline in earnings in the first half of this year as compared with 1923 was reported today by the Ajax Rubber Company, which announced net profits of $143,000, equivalent to 33 cents a share on the 425,000 shares of no par value capital stock.

In his remarks to stockholders, President Weston says in part: "Sales in dollars for early months of year were not as great as in same months of 1923.

"Lower material costs and substantial reductions in overhead are expected largely to offset lower prices now current.

"More normal spread of sales made it possible his year to reduce our seasonal bank borrowings approximately 30 per cent below peak of last year and 70 per cent of our bank loans have already been paid. It is expected the remaining 30 per cent will be liquidated by Oct. 31."

This showing compares with profits in the corresponding period of last year of $144,000, or 97 cents a share. The income account in the half year compares as follows:

	1924	1923
Sales	$7,311,105	$8,964,371
Operating expenses, etc.	6,736,117	8,106,116
Gross profit	574,988	858,255
Other income	59,736	58,829
Total income	634,724	917,084
Interest and depreciation	311,602	325,237
Revalue and rebates	179,605	177,127
Net profit	143,517	414,720

Continental Installs Stokers

The Continental Rubber Company, of Erie, Pa., is increasing the capacity of its power plant by the installation of two Taylor stokers under two 335 hp. boilers.

BRITISH RUBBER TRADE HOLDS GENERAL DINNER

Six British Rubber Organizations Dine Together in London to Commemorate British Empire Exhibition at Wembley—First Affair of its Kind Ever Held.

For the first time in the history of the British rubber industry the entire trade got together at a dinner held during the latter part of July at the Hotel Cecil, London. The affair was held under the auspices of the Institution of the Rubber Industry, the India Rubber Manufacturers Association, the Rubber Growers' Association, the Rubber Trade Association of London, the British Rubber Tyre Manufacturers' Association and the Cable Makers' Association.

The object of the dinner was to commemorate the British Empire Exhibition at Wembley for it was felt that the exhibition afforded an excellent opportunity of bringing together a representative gathering from all branches of the rubber industry.

Alexander Johnston occupied the chair. Among the notable guests were Sir Eric Geddes, Lord Colwyn and Col. Sir Ronald Ross. Alexander Johnston, chairman of the India Rubber Manufacturers' Association and president of the Institution of the Rubber Industry, also headed the dinner committee.

The attendance at the dinner numbered about 150. It was without a doubt the most representative gathering that has ever been held by the British rubber industry. Addresses were made by Alexander Johnston; Sir Stanley Bois; Sir Eric Geddes; Col. J. Sealy Clarke, chairman of the British Rubber Tire Manufacturers' Association; and D. F. L. Zorn. The dinner was characterized by great cordiality and it is to be hoped that it will be but the forerunner of similar affairs.

Sues for Land Title

The Mt. Vernon Rubber Co., Mt. Vernon, Ohio, in a suit filed in common pleas court against Fred W. Kahrl, trustee of the Mt. Vernon Chamber of Commerce has asked that Kahrl and the Chamber of Commerce be ordered to transfer title to the land, upon which the factory was erected, to the company.

The company alleges in its petition that it has the necessary machinery to operate the plant, that it is ready to begin operation and that the factory will be started when sufficient working capital can be obtained.

This capital, the petition says, cannot be obtained without a bond issue and a bond issue can not be floated until the company has title to the land upon which the building was erected.

The Chamber of Commerce purchased the ground which constitutes the factory site with the understanding that it was to retain title to it until certain conditions were fulfilled. The Chamber officials have claimed that these conditions have not been fulfilled and have persistently refused to relinquish this title.

PLAN TO LIQUIDATE BERGOUGNAN RUBBER

Creditors' Committee Issues Report—Fail to Agree on Plan of Reorganization with French Company—Total Claims Aggregate $1,748,122—Assets Not Determined.

The Creditors' Committee of the defunct Bergougnan Rubber Co., Trenton, N. J., of which Edward C. Stokes, president of the Mechanics National Bank of Trenton, is chairman recently mailed the following report to creditors:

"The efforts made by your Committee to bring about a reorganization of the Company have not been successful; a tentative plan of reorganization was prepared and presented to the Societe Generale Des Etablissements Bergougnan, and after consideration by them it was rejected, and a counter-proposal for reorganization was presented by them, which your Committee did not find at all satisfactory. It has therefore become necessary to proceed with liquidation in the most economical and efficient manner and that such liquidation proceed with all due dispatch.

"The total claims filed with the Receivers aggregate $1,748,122.36; included in this amount is the claim of the Societe Generale Des Etablissements Bergougnan for $1,216,436.05, a substantial part of which is secured by bonds executed under a trust mortgage covering the real estate and plant of the Company. We are advised that it is the intention of those charged with the administration of the estate to examine into the validity of the claim of the Societe Generale Des Etablissements Bergougnan, as well as all other claims filed. There is also included in the total amount of claims filed, the claim of Marlboro Cotton Mills, for $80,000.00, secured by bonds in the same amount, and the claim of Manville-Jenckes Co., for $24,712.15, secured by bonds of the face value of $40,000.00. There are other claims included in the total amount of claims aforementioned, the validity of which will necessarily have to be determined before the actual amount of indebtedness of the company can be established.

Assets Not Determined

"The assets of the Company consist of buildings, machinery, plant and equipment, the value of which cannot be determined until a sale is effected; and factory materials and supplies and finished goods amount to approximately $120,000.00; cash in bank as of June 30th, approximately $50,000.00, and accounts receivable (Receivers' sales) $16,000.00.

"The receivers are continuing the business of the company by selling the raw material and finished product at not less than seventy-five (75%) per cent of the value fixed by appraisers appointed by the Court.

"The entire matter has been somewhat complicated and settlement considerably delayed because of vexatious litigation, which has been instituted by T. F. Frawley, an attorney, claiming to represent a stockholder, and also claiming to represent some creditors, who, we are informed, is making a determined effort to put the company into bankruptcy.

"The proceedings which this attorney has instituted (and which are a duplication of those which have been pending for almost a year) will prolong the ultimate winding up and liquidation of the estate, will result in great additional expense, and a shrinkage and dissipation of the assets.

"These hostile proceedings, however, are being fought and will continue to be fought by those in charge of the administration of the estate with the utmost vigor."

TIRE EXPORTERS WATCH SOUTH AMERICA

Exporters of tires and other rubber products are watching South and Central America where wide preparations are being made for vast stretches of highway. Pan-American Highway Commissioners, who recently returned to their respective countries after a 30 day tour of United States roads during which they were in conference with executives of several rubber companies, expressed the belief that future transportation developments will be along highway lines as the era of railroad building in South America has passed.

The bus, the motor truck and the passenger car must take care of future transportation needs they said, and as a result rubber export managers are already making plans to develop export business in South American countries. Sales efforts will be redoubled because foreign rubber manufacturers have greatly cut into our export business during the last few years.

Premier to Erect Factory

Plans are being made by the Premier Rubber Manufacturing Co., Dayton, Ohio for the erection of a new factory building to cost approximately $250,000. The property was purchased from Charles A. Dille and Nathan Holstein.

The new structure will be approximately 65 by 125 feet and will be either three or four stories high, according to an official of the company. It will be of brick construction.

The Premier Rubber Manufacturing company was organized six years ago under the name of the Premier Rubber & Insulator Co. The name was changed three years later.

Products of the concern include hard rubber insulators, "Bakeolite" insulators, rubber heels, mechanical rubber goods and hard rubber parts for batteries.

Officers of the firm are: Joseph Westendorf, president; William Grieser, vice president; John Westendorf, treasurer; John Shively, secretary and Henry Spatz, general manager.

GOODYEAR ANNOUNCES MOTORCYCLE BALLOON

New Tire is 27 x 3.85 and Fits Standard 26 x 3 Motorcycle Rim—Features are Improved Clincher Bead and Two Extra Rows of Tread Blocks.

Production of the first cord balloon tire for motorcycles is announced by the Goodyear Tire & Rubber Co., Akron, Ohio, in a statement giving full details on a new 27 x 3.85 which fits a standard 26 x 3 motorcycle rim.

While the amount of inflation necessary for the new tire will vary somewhat with the weight of the machines, Goodyear says that the new balloon casing in general can be run at 20 pounds pressure for the front wheel and 25 pounds for the rear tire when the machine is equipped with a sidecar. Twenty pounds pressure for the sidecar tire.

Probably the most important feature about this new tire is the development of a special improved clincher bead. Tests with this bead have proved that at eighty miles on the straightaway and in several tests at 78 miles on curves, the tires could not be thrown.

Two extra rows of All-Weather Tread blocks have been added to the tread, making it come well-down on the sidewalls of the tire, giving non-skid traction on curves and enabling riders to take their machines out of ruts and over car tracks with a minimum of effort. The addition of two circumferential ribs on the sidewall add greatly to the appearance of the new tire.

The toes of the bead are longer and practically meet over the tube covering up the rim and spoke holes, thus rendering the need of a flap unnecessary. Because the tube rests on the beads in this new tire there is no danger of tube pinching or puncturing by rough spoke ends.

Tests conducted on machines used by the Akron Police Department show conclusively that the new tire cuts down the wear and tear on the motorcycle's mechanism, because vibration is reduced. The tire, like all balloon tires, gives easier riding and test riders report that the tires take the fatigue out of all-day riding.

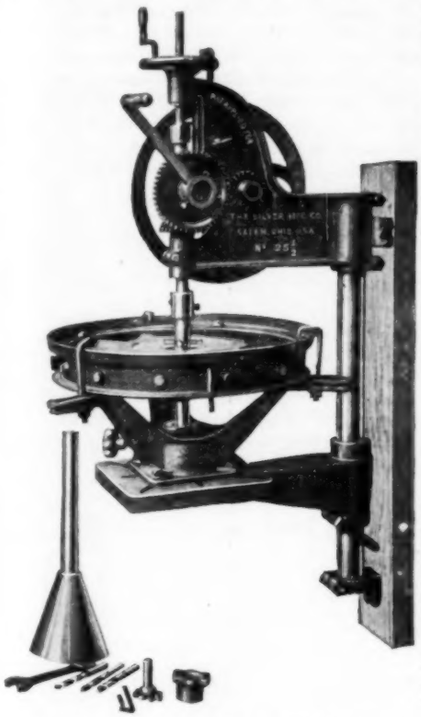
The tire will fit any 26 x 3 rim and can be used on any motorcycle now wearing either 26 x 3 or 27 x 3½ rims, if there is sufficient clearance between forks and fenders. Motorcycles now equipped with 28 x3 rims can be changed over at a very small cost by purchasing 26 x 3 rims and spokes for the wheels. The old hubs can be used again.

Victor Rubber Resold

The plant of the Victor Rubber Co. purchased several years ago in bankruptcy proceedings by the Allentown Trust Co. was sold recently by the latter company to the Eastern Real Estate Co. for $85,000. Under a deed granted on March 29, 1809 the buyers have obtained the rights to a mill race. The plant at the present time is not in operation.

NEW BALLOON WHEEL ADAPTER ON MARKET

A new and inexpensive balloon wheel adapter now makes it possible for any tire dealer to handle the complete balloon tire change-over in his own shop. Dealers who are using this machine say that they can now prepare a set of four



Silver's Balloon Wheel Adapter

wheels, for any make of car, in one hour.

Silver's Balloon Wheel Adapter is the first machine on the market that bores, chamfers, faces and also drills wood wheels. It will take wheels up to 25½" in diameter and it has a boring range of from 1½" to 6".

Another feature that will interest dealers is the fact that this machine, when not being used for changeovers, serves many other uses around the shop as a drill press. By the removal of the spider from the swing arm, it is converted into a regular post drill.

It is suitable for both large and small dealers because it is furnished with crank for hand operation or with tight and loose pulleys for power.

This machine is manufactured by the Silver Mfg. Company, Salem, Ohio, who also holds the patent rights. The Silver Company has had 60 years experience in manufacturing carriage making machinery and drilling devices, and was the first to design and manufacture a machine for boring and facing wood wheels.

Tire Exports Slump

Exports in tires for the first half of 1924 amounted to $7,382,889 as compared with $10,727,789 during the same period last year. This decline in American exports is attributed to the fact that foreign tire manufacturers have adopted an agressive selling policy and by so doing have confirmed the prediction made by large factors in the trade that American producers would lose a fair percentage of the trade they gained before and after the war, when foreign manufacturers were again on their feet.

This reduction has been especially noticeable in Great Britain and the British colonies, inasmuch as British producers have been endeavoring for some time to have their tires used to the exclusion of all others. This fact is brought out by recent statistics which show that exports to England during the first half of 1924 amounted to $955,302, as against $2,127,137 in the same period of 1923.

Exports to other countries, however, have shown an increase as in the case of Mexico, this country importing tires aggregating $493,668 as against $418,237 in 1923. Other countries showing an increase are Belgium and the Philippine Islands.

Goodyear Reports Earnings

The Goodyear Tire & Rubber Co. for the six months ended June 30, 1924, reports consolidated net income of $4,173120, after interest and charges. After allowing for the halfyear's dividends on the 8 per cent prior preference stock and the management 6 per cent cumulative stock, the balance is equivalent to $5.50 a share on $65,079,600 outstanding 7 per cent cumulative preferred, on which dividends have accrued from Oct. 1, 1920.

Allowing for only six months' dividends on the 7 per cent cumulative preferred, the balance is equivalent to $1.56 a share on the outstanding 831,585 shares of no-par common. This compares with the net of $6,314,318, or $8.47 a share on 7 per cent cmulative preferred in the first half of 1923, and $3.66 a share on 882,158 shares of common after allowing for the six months' dividend requirements on the 7 per cent preferred.

The consolidated income account for the half year compared with 1923 follows:

	1924.	1923.
Net sales	$55,412,035	$55,439,631
Operating expense	49,847,337	48,372,574
Operating profits	$5,564,698	$7,607,057
Net profit sub. cos.	1,226,655	1,900,022
Total income	$6,791,353	*$8,967,079
Bond interest, &c	2,618,233	2,652,761
Net income	$4,173,120	$6,314,318

*Operating profits of California Company of $620,392 not included, but applied in reduction of California deficit and consequently an addition to parent company equity, but not available for interest.

Tuscora Officers Elected

Henry L. Houk was recently elected president of the Tuscora Rubber Co., Dover, Ohio, which a syndicate headed by Mr. Houk purchased several months ago. Other officers elected are: Joseph P. Frisby, vice president; Kenner McConell, second vice president and treasurer; and L. G. Johnson, secretary. New directors include Norman W. Senhauser, Walter R. Ritter, E. S. Weber and Andrew Deis.

KELLY-SPRINGFIELD PERFECTS KELOMETER

The Kelly-Springfield Tire Co., Cumberland, Md., is distributing to its dealers a new device to tell the motorist quickly and accurately when a balloon tire is properly inflated. This device, known as the Kelometer is an enlarged form of a mechanic's outside caliper. It is made of light, rigid metal stamped and provided with a series of holes in the regulating cross piece to set the outer points at the proper width.

The measurement is made at the great-

The Kelometer in Use

est bulge of the tire near the point of road contact by setting the pin in the proper cross hole corresponding to the size of the tire used and with the car loaded normally, let air in or out until the caliphers show correct deflection. The entire operation takes only a few moments.

Servus Plant Reopens

The factory of the Servus Rubber Co., Rock Island, Ill., which closed July 21 in order that necessary repairs might be made to the boilers and other equipment recently reopened. The boilers have been in constant use, day and night, for over a year. The company manufactures rubber soled footwear.

Barr Rubber Buys Ravenna

Nelt Barr, president of the Barr Rubber Products Co., Sandusky, Ohio, recently announced that his company had purchased the plant and property of the defunct Ravenna Rubber Products Co. at Ravenna, Ohio. Mr. Barr said that the plant will be dismantled at once and the machinery moved to Sandusky to be installed in the Barr plant. The Ravenna company manufactured druggists' sundries and had a well-equipped plant.

Erection of a brick addition to the present Barr plant will be necessary to provide space for the new machinery. Work on this will be started at once and upon its completion the working force will be increased from 75 to 100 men.

N.T.D.A. REPORT SHOWS TIRE SALES IMPROVED

A report on the June 30 questionnaire of the National Tire Dealers' Association shows greatly improved conditions in the retail tire trade. Dealers reporting from 25 states show inventories have decreased approximately four per cent as compared with the figures March 31. The report shows the average number of tires in the hands of members to be 385 and the average number of tubes to be 460.

Sales in June were better than the preceding month but purchases made by members of the N.T.D.A. were slightly under May. Collections in June were reported fair.

Speaking about the forthcoming annual convention of the association in Akron, Ohio, November 18-20, George J. Burger, president, said, "This convention is one that we are looking forward to and may be the turning point for better business conditions for both the manufacturer and the recognized tire dealer.... This business can be made a better business if both branches of the industry will cooperate. We are of the opinion that there is big room for improvement from a tire dealers' standpoint in the conduct of this business, and the same applies to the manufacturer."

Westfield Tire in Difficulties

Eugene G. Martel, a stockholder, director and officer of the Westfield Tire & Rubber Co., Westfield, Ohio, recently filed a bill in equity in the superior court in which it is asked that the above company be declared insolvent and a receiver appointed. Mr. Martel being a creditor, brings this action in behalf of himself and all other creditors of this company, which was organized March 28, 1922, with a capital of $15,000.

The Standard Oil Co. of New York, Tarbell-Watters Co., William J. Poirier, Frank B. Watters of Springfield and Leroy C. Coburn of Westfield are among those named as defendants in the case.

Officers of the company are Eugene G. Martel, president and manager; Wm. J. Poirer, treasurer and clerk; Eugene G. Martel, Wm. J. Poirer and Frank B. Watters, directors.

To consider the making of a general assignment for the benefit of the creditors, a notice of a special meeting of stockholders was issued, this meeting to take place at 35 Main Street, Westfield, at 2 p. m. Aug. 7. Objections to such an action has been made by the plaintiff.

Ames Holden Shows Profits

The first half of the current fiscal year of Ames, Holden Tire & Rubber Co., Ltd., Kitchener, Ont., has resulted in a creditable showing that will undoubtedly prove gratifying to the shareholders. During the first six months there was a very substantial increase in the volume of business done, this, in fact, being approximately 100 per cent greater than for the corresponding period of 1923.

A very encouraging net profit is shown for the period after all charges including depreciation, taxes and allowance for income bond interest, as compared with a slight deficit for the first half of 1923.

Inventories of finished goods, materials and goods in process are relatively low and the banking position is a comfortable one.

The company's tires are reported to be meeting with a good reception as well as its lines of rubber footwear.

No action has been taken with regard to the payment of the interest on the income bonds, it apparently having been the policy of the directors to conserve the company's working capital which has improved substantially over a year ago. It is pointed out, however, that this interest is cumulative.

NEMO GRANTED PATENT ON RUBBER GIRDLES

A recent announcement was made by the Kops Bros., Inc., New York, N. Y., that a patent has been granted to the makers of "Nemolastik" silk-covered rubber reducing girdles, said patent giving them the exclusive rights to make and sell elastic reducing garments with coverings of any absorbent material.

The opinion has been expressed that the larger corset manufacturers in view of the fact that this patent has been granted will cease to manufacture garments which have been of similar design to those put out by the patentee but on the other hand there are many who anticipate a long drawn out fight in the courts before the makers of the 'Nemolastik" girdle are able to prevent others from encroaching on their patent.

Fire Destroys Rubber Plant

Lightning is believed to have started the fire that destroyed the factory of the Mystic Rubber Co., Medford, Mass. recently. The factory was owned by Charles H. Brown who has been absent from the city for several weeks during which the plant has been closed.

U. S. RUBBER CO. OPENS NEW BUFFALO QUARTERS

The "Keds" convention met during the latter part of July in the new and larger quarters of the Buffalo branch of the United States Rubber Co. at 133-143 East Swan St. Since 1907, when the branch was first established with a few clerks in Pearl St., the volume of business has steadily increased. Sales now approach $4,000,000 annually.

The branch is located in a four-story building, having a floor space of 115,000 square feet. All the departments are combined under one roof and the force of 125 employees works with entirely new equipment. According to C. P. Meyer, Buffalo district manager, the site was chosen with a view to expansion and it is in the center of the wholesale district as mapped out by the city planning commission.

T. J. Needham, general manager of the branch stores department, headed the "Keds" convention. Other officials in the manufacturing, credit and advertising departments were in attendance. The program included informal meetings and the outlining of plans for 1925.

Rubber Bathing Shoes in Demand

With prices at the lowest level of the year, a slight improvement in sales is reported by the majority of dealers in rubber goods. Many factors in the trade look for a considerable increase in activity before the end of this year.

Rubber bathing shoes and caps have come in for the greatest amount of attention, while rubber playthings come next in the volume of business done. For other rubber products little additional business has been noted.

Due to the excessive wet weather encountered this spring sales of raincoats and rubber overshoes were greater than during the same period last year.

Dealers in mechanical goods in face of a general inactivty are nevertheless inclined to be optimistic.

Cleaning Gutta-Percha After Being "Treaded" in the Federated Malay States

BRAZIL RUBBER ZONE CUT OFF BY REVOLT

State of Amazonas in the Northwestern End has been Without Communication for Over a Month—Manaos, its Capital, One of World's Chief Rubber Markets.

It was learned recently from reliable sources that the outbreak of another revolution in Brazil has kept the State of Amazonas in isolation and without communication for over thirty days. Manaos, the capital of the affected district, is one of the principal rubber markets of the world.

Censorship Keeps Secret

Due to the strict censorship exercised by the Brazilian authorities no word of the uprising has reached the outside world. There is no representative of the United States at Manaos; Great Britain is the only nation that has a consular agent in the city. The nearest American agent is stationed at Para, at the extreme eastern end of the republic. It is thought that U. S. Consul Pickerel of the Para office gave the State Department a complete report when he returned to the United States several weeks ago.

Although Dr. J. C. Muniz, Brazilian Deputy Consul General in New York, denied any knowledge of the fresh outbreak, details of the trouble were gathered from steamship and export interests.

Unable To Reach Manaos

Garnett Day, of the importing firm of Bennett, Day & Co., said that for three weeks his firm has been trying to reach Manaos by every conceivable method without avail.

"This immense territory," he said, "from which we get the best rubber in the world, has been suddenly wiped off the map, with millions of dollars of American money and merchandise at stake. This rubber comes from the Acre district, a piece of ground which was at one time claimed by both Bolivia and Brazil, but which the United States as arbitrator years ago gave to Brazil. It is possible that this old controversy has been revived, or that a political clique, taking advantage of the Sao Paulo affair, decided upon a coup d'etat."

Otto Meyer, of Meyer & Brown, rubber broker said, "The Amazonas revolution may be an echo of the Sao Paulo affair but Manaos is so distant from the former city, that it is hard to reconcile such a premise. The fact remains, however, that we have been cut off from Manaos, that we have been unable to get even a cable through to our agents, and that vessels desiring to reach this city down the Amazon have been held up by the Brazilian authorities."

Premier Rubber to Build

The Premier Rubber Mfg. Co. of Dayton, Ohio. having purchased three additional lots adjoining their present site, Edmund St. and the B. & O. are contemplating the erection of a new factory building.

The new building which will cost in the neighborhood of $250,000 will be 65 by 125 feet and will be from three to four stories in height. The three lots at an approximate amount of $15,000 were purchased from Chas. A. Dille and Nathan Holstein.

Favors Rubber Pavement

E. S. Dorr, Planning Engineer of the City of Boston, in a recent letter to Joseph A. Rourke, Commissioner of Public Works, recommended the use of rubber paving for those bridges in Boston that are to be repaved. Rubber paving for the Harvard Bridge is being considered.

KELLY-SPRINGFIELD TIRE DENIES CHANGES

Arnold Scheur, president and chairman of the board, and Samuel Woolner, Jr., chairman of the executive committee of the Kelly-Springfield Tire Co., recently denied reports of a contemplated change in the management of the company. It was stated that the rumors probably arose because minor changes were made in the personnel, including the appointment of Thomas A. Lindsey as general manager.

Economist Goes to Firestone

Dr. Fred E. Clark, formerly professor of economics and marketing at Northwestern University, Evanston, Ill., has accepted a position with the Firestone Tire & Rubber Co. as one of its specialists in analyzing problems of distribution and merchandising. It is a firm belief of the Firestone organization that distribution efficiency is as necessary as production efficiency. To this end Firestone has a class of 35 recent college graduates now taking an intensive course in the manufacture and marketing of rubber tires from the ground up in order that they may fill places of responsibility in the factory, office or sales divisions.

To Tap Basilan Trees Soon

More than eighty thousand Para Rubber trees are growing on the Basilan Rubber Estate on the Island of Basilan, P. I. More than sixty thousand trees are large enough for tapping.

New machinery is being installed at the Rio Grande Plantation at Cabacan, Cotobato Province, Mindanao, and as soon as the same is in working order active tapping will be undertaken. Up to the present time no tapping has been done except for experimental purposes.

Eleven years ago Ex. Gov. Frederick Lewis introduced Ciera rubber seeds in the Province of Bukidnon, and at the present time there are a number of trees having a girth of more than seventy inches three feet above the ground. Bukidnon is located in central Mindanao and where the best rubber is grown the altitude is more than 1000 meters. The rubber trees there are used for decorations and for fence posts in the villages as there is no use for the latex.

GREATER RUBBER YIELD PREDICTED THIS YEAR

World's Total for 1924 Estimated at 421,000 Tons, as Compared With 412,771 Last Year—Shipments thus Far Show a Decrease of 6,874 Tons.

It is estimated that the world's production of plantation rubber in 1924 will be 390,000 tons, and that the total production, including Brazilian and other native output, will be 421,000 tons, of which the United States will retain 315,000 tons. According to advices received by the Bankers Trust Co. of New York from its English information service, the plantation production in 1923 amounted to 384,771 tons and the total world's production to 412,771 tons, of which the United States retained 300,364 tons and Great Britain 12,536 tons.

The highest price of plantation rubber per pound in 1923 was 1s. 6½d, and the lowest 1s. 1¼d. To the end of April, 1924, the highest price has been 1s. 2½d and the lowest price 11½d.

The Stevens restriction scheme which was put in force about 18 months ago was intended to stabilize the price and production. The rubber trade of Great Britain is discussing how it may be improved for the benefit of all parties concerned. Its chief present defect is said to be its inflexibility. It is proposed to improve the scheme by the adoption of monthly decisions as to export allowances and the issue of monthly permits; also by reductions of 5 per cent of the "standard production" for every penny or fraction of a penny under 1 shilling per pound.

Another advantage of amending the scheme is said to be that an opportunity could be provided for participation by the Dutch. It is stated that both producers and consumers would benefit by this modification of the scheme, as the price and production would be much more readily stabilized owing to the absence of delay in either restricting production of rubber when it is not required or its ready release when it is wanted, resulting in a really stabilized market. The reassessment of the standard production now being made will date from Nov. 1, 1923. Shipments of plantation rubber to date show a decrease of 7217 tons and world shipments from producing countries, a decrease of 6874 tons, as compared with the same period of 1923.

Akron Broker Insolvent

Attorney B. M. Skelton has been named receiver and H. W. Schwab attorney for the receiver for the brokerage business of Leland C. Powell in the Ohio state bank building, Akron, who has been missing since July 29. Powell, who is charged with embezzlement of funds of his clients said to total $35,000., was connected for seven years with the labor department of the Goodyear Tire & Rubber Co. and most of his clients were Goodyear employees.

Compounding with Devulcanized Waste

Advantages are on Side of Economy—European Manufacturers Use Oil Substitutes and Tar Instead of Devulcanized Waste

By a Millroom Man

IN modern rubber factory practice anything that may lower production costs receives thorough attention. New machinery and appliances also alterations in materials and methods demand constant study to keep pace with competition. No departments pay closer attention to economy than those in which the initial operations are conducted i.e. compounding, mixing and running the stock. In the former skill lies in producing satisfactory qualities at a reasonably low cost—, the mixings so proportionated that the subsequent manufacturing processes may be carried out with the least expenditure of labor and power.

In the making of formulas the chemist or compounder has many ingredients at hand. One of the most important of these is the product derived from worn out rubber goods, ground and employed as an adulterant, or softened by devulcanization, in which form it can be used in the largest proportions. Cured waste may be classified as follows; the softer, lower grade such as hose, mold overflow, mats, wire and cable strippings, these ground and without devulcanization used in steam and press cured goods, also the softer red and white scrap can be used after simply grinding. For mold work, heels, grey inner tubes, tire pealings, and solid tires, all of good quality but hard cured necessitating devulcanization at a high temperature, and the use of oils to obtain a degree of plastification.

Reclaiming Old Shoe Waste

Old shoe waste is in a class by itself, requiring the most careful treatment when reclaiming. It must be entirely free of grit, oil, and sulphur, and of course very uniform in quality; all traces of acid used for destroying the fabrics have to be washed out or neutralized with a soda solution. Upper and soling batches compounded with shoe reclaims mix quickly and do not require the amount of refining needed for rubber-mineral mixes. They are less sensitive to heat and therefore easier and better to calender, and are not so adversely effected by the cutting room scrap (amounting to about 40 per cent). Soling batches carrying reclaims run with a sharp impression and the calendered stock does not draw or shrink to any extent, thus it can be cut and put on the shoe shortly after being run. Vulcanization is accomplished at a lower temperature or in a shorter time which leaves the fabric as well as the whole shoe in a good condition for withstanding aging. For shoe stocks a ½ oz. of sulphur and ½ pound of litharge to each pound of new rubber is the usual proportion, but with certain reclaims in the batch a saving in litharge can be made and a small quantity of caustic lime used in its stead. American manufacturers have always been the largest users of devulcanized waste, practically all footwear and proofing formulas carry it, — in fact in the past more attention has been given by them to the recovery and use of old waste rubber than the planting of new.

For mechanical goods regenerated rubber is considered mostly as an adulterant, value being about equal to the quantity and quality of rubber content, to which should be added a saving in milling and vulcanizing time; also the use of smaller quantities of litharge and blacks, and in white, red and light colored compounding the proportion of zinc, lithapone and other expensive coloring pigments can often be reduced.

European manufacturers use very little devulcanized waste, their open heat formulas carrying a fair percentage of oil substitutes and tar as plastifiers. Compounding ingredients are cheaper there than here. Tar and lampblack if bought directly from the gas houses costs about one quarter of what Americans pay, which no doubt has considerable influence in their sticking to the old methods of compounding for open heat goods. For mold work and the like they prefer to grind the better qualities of waste to a very fine dust (grinders with a friction as great as one to five are often seen) and employ it without devulcanization. It is true to obtain plasticity by devulcanization elasticity must be sacrificed to a considerable extent, but grinding to a very fine dust is probably as detremental as devulcanizing as regards the loss of elasticity. Even the finest dust will not incorporate as perfectly with new rubber as devulcanized stock, and a larger percentage of oil is apt to be used when compounding with dust, which after vulcanizing drys out leaving the goods in a hard condition.

Plastic and Semi-Plastic Reclaims

Devulcanized waste may be divided into two classes, plastic and semi plastic. The former has more value for open heat work (about 50 per cent of the weight of an overshoe is made up of this) as it produces a very nice calender surface. There are perhaps 50 or 60 brands of devulcanized stocks on the market, all different in some particular, and the chemist and millroom man should be acquainted with as many of these as possible to be able to determine which is best for this or that compound. Occasionally controversy arises over the advisability of using reclaims in compounding best quality goods. The objectors advance the argument that many brands of reclaims are made from worn out articles already having reclaimed stock in their composition, thus a percentage of the material has been vulcanized and devulcanized several times and is bound to have suffered deterioration. It may be said however that reclaimers sort their scrap very carefully, and also make constant tests of the finished product therefore standard brands are as reliable as any of the other ingredients employed in the compounding of rubber.

Demand for Toy Balloons in Central Mexico

There is an appreciable demand for toy balloons and squealing rubber toys in the form of animals, dolls and kewpies, in Central Mexico. While a few of these novelties reach this country from Germany, the greater part are imported from the United States. Prices and quality of these products from these two countries are similar.

Balloon sizes running from No. 45 to No. 60 are the most popular. Spherical gas balloons are preferred. Dominant colors are red and green. As these balloons are much in evidence on patriotic days, it might be well for American manufacturers to use more often the three color combination of the Mexican flag. Gold and silver and mottled balloons are never seen here although their introduction might prove successful.

No attempt has been made to interest local concerns in the use of toy balloons as advertising media. It is suggested that an effort be made by manufacturers to show the advantage of this method of advertising, either by communicating with local importers who purchase directly from the American manufacturer or by submitting samples along with their circulars.

Cash transactions are common with this class of goods although a request for sixty days' credit should not be considered unreasonable from responsible buyers. Local competition in these novelties need not be feared.

Abnormal Conditions Cause Lighter Rubber Exports

Value of Rubber Products Exported in Fiscal Year Ended June 30 Fall Off $2,420,020—Manufactures Other than Tires Show Gain

By P. L. Palmerton
Chief of the Rubber Division, Dept. of Commerce

DURING the fiscal year ended June 30, 1924, the value of rubber manufactures exported from the United States to foreign countries was $35,542,822, as compared to $37,962,842 in the preceding fiscal year. The reduced trade this year is not general for all classes of rubber manufactures, but is almost wholly the result of the situation in world trade in pneumatic tires.

Export sales of rubber manufactures other than tires, which in the aggregate make up slightly more than one-half of the total shipments, showed a satisfactory gain in almost all classes. The trade in mechanical rubber goods was much heavier, exports of rubber belting, hose and packing having all increased.

Each class of rubber footwear has likewise enjoyed increased trade, except canvas rubber-soled shoes which decreased, owing to an important American firm having diverted large orders to its Canadian plant. Exports of rubber boots from the United States numbered 447,547 pairs in the past year as compared with 274,037 pairs in the year before, rubber shoes 1,252,173 pairs as compared to 832,739 pairs, canvas rubber-soled shoes 3,209,266 pairs as compared to 3,956,103 pairs. Rubber heels and soles exported during the last fiscal year weighed 2,182,298 pounds as compared with 2,041,293 pounds in the year before. Exports of waterproofed piece goods and clothing, and of rubber specialties, are heavier this year. Solid tires for trucks exported in the fiscal year 1923 numbered only 79,428 as compared with 103,983 in 1924. There was only a slight decline in the net value of exports of hard rubber articles, valued at $726,713 in 1923 and $636,503 in 1924.

The value of automobile casings exported from the United States in the fiscal year 1923 was $17,545,308 or 46.2% of the total value of rubber goods exports during that period. For the fiscal year 1924, the value was $12,947,642 or only 36.4% of the total value of rubber goods exports.

The Principal Causes of the Decline

Some of the reasons for the striking difference in the tire trade during the two periods are worthy of special mention. Exports for the year ended June 30, 1923, were heavier than normal, and represent the peak of the growth in the tire trade which had expanded steadily since the early months of 1921. This steadily increasing American export trade naturally aroused European tire manufacturers, 50 per cent of whose business is dependent on exports. The exchange situation prevailing during 1923 was such as to enable Michelin, the leading foreign tire manufacturer, whose principal factories are in France and Italy, to sell tires profitably at prices which would actually mean financial loss to American companies. Michelin took advantage of the situation and initiated a series of price cuts affecting tire prices in practically all the important tire markets of the world.

This move forced out of export trade the majority of the smaller American concerns which had been developing export trade and cut into the business of the stronger American firms who met French prices in those markets where trade depended almost wholly on such action, and in markets where there products were more strongly entrenched, reduced prices to a point slightly above the Michelin level. Some of the smaller American firms remained in the trade by giving special concessions to established foreign customers, or through changing their method of operation from a large scale business with a single distributor in a particular foreign country to a smaller direct-to-dealer business with important retailers.

The result of all this was a steady decrease in American tire exports, which continued until the early months of 1924. Tire prices increase, again instituted by French manufacturers in March and April, 1924, only partially corrected the situation. The success of the Michelin 31 x 4.40 clincher balloon cord tire for 23 inch rims, and of Michelin metric balloon sizes, has been another factor of great importance in the export trade, these tires having been very favorably received in the markets where they have been introduced.

Trade with Great Britain Affected by Dunlop

The Dunlop Rubber Company of England is the second strongest competitor of American tire manufacturers in export markets. The position of this company was weakened at the beginning of 1922 by the unprecedented losses which it had experienced in the preceding year. During 1922, the Dunlop tire was of a quality said to be inferior to those of their leading competitors and the company experienced a very difficult year. The faults in the product were corrected and early in 1923 the company began one of the greatest advertising campaigns in tire history. This campaign is still continuing. Aided by the affiliations of the company's financial backers in many British industries, and appealing to the patriotic sentiments of tire dealers and the Britsh public, the advertising campaign and the higher quality of the product has changed Dunlop from a poor second to Michelin in the British market, to at least an equal competitor, while the exports of American automobile casings to England have fallen from 422,566 in the fiscal year 1923 to only 155,169 in 1924. Dunlop has likewise increased foreign sales considerably during the past year particularly in the Scandinavian countries, British India, British South Africa, Chile, Mexico and the Straits Settlements, and it is reliably reported that the company is about to place on the British market a 31 x 4.40 clincher balloon tire to compete with Michelin.

There were 27 countries taking over 5,000 tires each from the United States in the first half of 1923. The exports of automobile casings to these countries listed in the order of importance as markets in the 1923 period have been as follows during the first half of 1923 and 1924:

Exports of Automobile Casings from United States

	First Six Months 1923 number	1924 number
England	253,419	85,540
Argentina	70,705	39,606
New Zealand	53,233	22,073
Canada	40,418	30,898
Mexico	39,998	45,804
Cuba	39,083	40,038
Australia	36,128	30,251
British South Africa	33,207	13,877
Denmark	32,576	33,463
Sweden	30,204	24,170
Brazil	26,725	20,163
Philippine Islands	24,519	25,615
Japan	22,480	51,329
Norway	14,555	8,227
Uruguay	10,990	7,786
Straits Settlements	10,466	5,431
British India	9,856	8,446
Italy	9,784	4,163
Dutch East Indies	9,657	7,007
Peru	7,701	12,625
Chile	7,604	5,194
Netherlands	6,701	7,185
Venezuela	6,197	7,135
Spain	6,065	4,620
France	5,814	2,744
Belgium	5,259	5,081
Colombia	5,008	3,718

(Continued on Page 383)

New Method of Manufacturing Cushion Tires

Patent on Process by which Tread Portions may be Quickly and Accurately Applied Recently Granted to Fred D. Fowler

AN improved method of manufacturing what are known as "hard base" cushion tires or tires of cushion rubber vulcanized to a metal base through the intermediary of a layer of hard rubber which serves as a tie between the soft rubber of the tire and the metal carrying rim has been invented by Fred D. Fowler. The invention has been patented in the United States Patent Office under date of July 22, 1924 and Serial No. 1,502,027. Mr. Fowler has assigned it to the Hood Rubber Co. of Watertown, Mass.

The rubber tread portion of cushion tires is usually formed by the use of an extruding machine having a die opening corresponding to the cross section of tire, from which opening the said cushion tread issues as a continuous strip which is cut up into the desired lengths. Considerable difficulty has been experienced in applying these strips to the rims owing to the tacky nature of the material and its stretchability, coupled with its bulky nature.

Aims of the Invention

According to the patent, the present invention aims to provide a method by which the strips may be accurately severed into the requisite lengths, and rapidly and accurately applied to the carrying rims, and the invention includes the novel method of procedure hereinafter described, and particularly defined by the appended claims.

In order that the invention may be better understood, reference is made to the accompanying drawings, in which:—

Figure 1 is a perspective view of a soft rubber tire strip as formed in an extruding machine in the customary manner.

Fig. 2 is a perspective view showing the method of placing the said strip in a support for application to the rim.

Fig. 3 is a similar view showing the step of applying the strip to the rim.

Fig. 4 is a section on line 4—4 of Fig. 3, and

Fig. 5 is a view showing the method of joining the ends.

Fig. 6 is a view showing the rolling and stitching action.

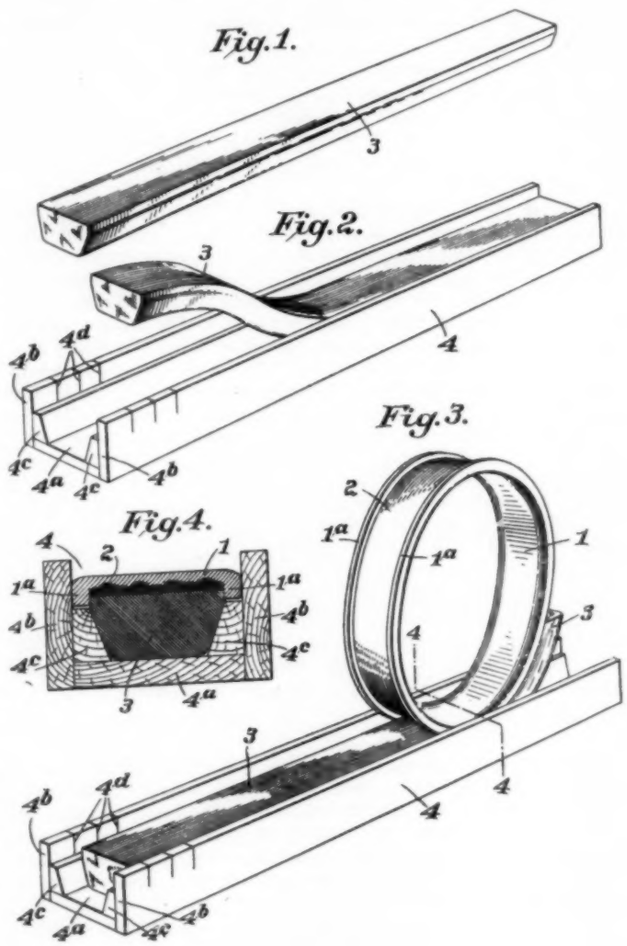
Referring by reference characters to this drawing, the numeral 1 designates the usual rim band having the hard rubber base 2 secured thereto in the customary manner. 3 designates the soft rubber cushion tire strip which has been formed in the usual or any desired manner, as for example, by the use of a tubing machine as aforesaid. The material as it issues from the tubing machine is severed into lengths corresponding approximately to the desired tire to be formed, or more properly, to correspond to the circumference of the rim to which the strip is to be applied. Due to variations in operating conditions, such for example, as temperature, speed of the extruding machine, etc., tread strips cut of exactly uniform length may not always be of exactly the same weight.

It is desirable that the tires shall be of exactly uniform weight, and to provide for this, Mr. Fowler weighs the strips and cuts them to uniform weight. The strip 3 is then placed in a supporting and guiding trough 4 which has an interior cross section corresponding to the cross section of the finished tire and rim, said trough embodying a bottom 4^a and sides 4^b, the distance between the inner walls of which at the upper part thereof, corresponds closely to the distance between the exterior faces of the side flanges 1^a of the metal rim 1. The lower corners of the channel thus formed are provided with filling pieces 4^c which cause the lower portion of the channel to conform approximately in shape to the cross section of the cushion tire strip.

The strip is placed in the trough by first depositing one end of the strip in one end of the trough and then successively depositing the remaining portions, as indicated in Fig. 2, and as the operator lowers the free end of the strip into the trough, he can determine by indicating marks 4^d on the trough, whether the linear measurement of the strip, as thus deposited, corresponds exactly with the circumference of the tire base to which the strip is to be applied. If he finds that the strip is a little short, he stretches the same sufficiently to cause its end to align accurately with the proper indicating mark, whereas if the strip proves a trifle long, longitudinal pressure in a reverse direction on the strip, compresses the material sufficiently to shorten the strip the desired amount.

Thereafter the carrying rim 1 is pressed down upon the strip at one end of the trough causing the end of the strip to adhere to the rim by reason of its sticky and tacky nature. The rim is then rolled over the strip in the manner shown in Fig. 3, causing the strip to be picked up out of the trough by the rim and wound thereon so that the tread is applied to the tire and appears as shown in Fig. 5. Thereafter the rim is supported in any suitable manner, as for example, by an ordinary chuck or spider, shown conveniently in Fig. 5, and operators using blunt edged tools 5, and by pressure in the direction indicated by the arrow, close up the gap 3^a by crowding the material together.

In order to make sure that every part of the tread strip is pressed into contact with the hard rubber base, and the inner corners are pressed or worked into the angles formed by the rim flanges 1^a and hard rubber base, the assmbled tire and



rim, while suitably guided is subjected to the action of squeezing or pressing rollers 6, 6*, and the side edges to the action of stitchers shown at 7, 7, which are simply smooth edged rotating discs. For this purpose apparatus such as disclosed in a companion application filed in the U. S. Patent Office on the 21st day of November, 1923, Serial No. 676,148 is used.

Fig.5.

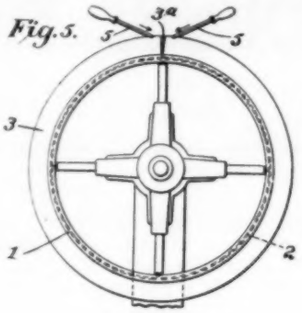
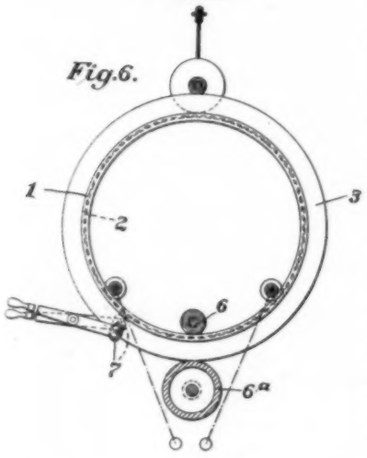


Fig.6.



The inventor claims:

1. The method of making cushion tires, which consists in placing a cushion tire strip in a channeled guide, rolling over the same a carrying rim to cause the cushion strip to adhere to the rim, and subsequently vulcanizing the tire on the rim.

2. The method of making cushion tires, which consists in depositing a strip of rubber of given weight in a guide trough and subjecting said strip to force exerted in an endwise direction to cause its ends to properly align with a suitable designated indication on the trough, thereafter rolling the rim over the cushion portion to cause the said portion to adhere to the rim, and subsequently vulcanizing.

3. The method of making cushion tires, which consists in providing a strip of cushion material of the proper cross section, placing the same in a guide trough having portions for aligning the cushion strip and other portions constituting rim guiding portions, rolling a rim over the said strip between the said rim guiding portions to cause said cushion strip to adhere to the rim, and subsequently vulcanizing said tire on the rim.

4. The method of making cushion tires, which consists in providing a strip of cushion material of the proper cross section, placing the same in a guide trough having portions for aligning the cushion strip and other portions constituting rim guiding portions, rolling a rim over the said strip between the said rim guiding portions to cause said cushion strip to adhere to the rim, subjecting the end portions of the tire to pressure applied against individual portions thereof to close up the gap between the tire ends, and subsequently vulcanizing the tire to the rim.

5. The method of making hard base tires comprising forming a base of hard rubber on a rim, extruding the cushion portion of the tire, placing said cushion portion on a flat support, rolling the rim over said cushion portion to cause said cushion portion to adhere to the hard rubber base, and subsequently vulcanizing.

6. The method of making cushion tires which consists in placing a cushion strip on a suitable support, rolling over the strip a carrying rim to cause the strip to adhere to the rim, displacing end portions of the strip to fill up the gap between the juxtaposed ends of the cushion strip, thereafter subjecting the cushion strip to progressive pressure applied radially of the rim, and finally vulcanizing the tire.

7. The method of making cushion tires which consists in placing a cushion strip on a suitable support, rolling over the strip a carrying rim to cause the strip to adhere to the rim, displacing end portions of the strip to fill up the gap between the juxtaposed ends of the cushion strip, thereafter subjecting the cushion strip to progressive pressure applied radially of the rim, subjecting the edges of the cushion strip to a "stitching" action, and finally vulcanizing the tire.

Abnormal Conditions Cause Lighter Rubber Exports

(*Continued from Page* 381)

The only countries to which there was any marked increase of tire exports are Japan, Mexico, and Peru, although there were slight increases in exports to the Philippine Islands, Cuba, Denmark, the Netherlands and Venezuela. The Rubber Division has previously called attention to the heavy tire exports to Japan and the possible danger of overstocking the market, and although a large share of the tire shipments are for original equipment on American cars shipped to Japan, it is still believed that tire stocks in Japan are somewhat heavy. The Peruvian market is picking up to some extent with improved economic conditions there, and the Mexican trade is larger this year than last chiefly as a result of the increased number of automobiles in the country.

Another factor affecting the volume of the tire exports from the United States is the tendency of certain American firms to fill export orders from Canadian branch factories. Some of the reasons making it desirable to fill export orders from Canada are:

(1) To secure the benefit of lower tariff rates in certain British and French possessions.

(2) To cater to the sentiment of customers in Great Britain and certain British possessions.

(3) To maintain production in Canadian plants during the dull winter season.

(4) To concentrate the production of certain sizes of tires, as for example obsolete sizes or metric sizes, in one factory.

(5) When tires produced in Canada bear a trade name distinct from tires produced in the United States, to increase foreign sales by offering two separate lines, perhaps through separate distributors, in foreign markets.

Under the impetus of these orders diverted from factories in the United States, exports of pneumatic casings from Canada increased in value from $4,431,002 in the fiscal year ended March 31, 1923, to $5,701,903 in the following year. Canadian tire exports to England, Argentina, New Zealand, France and the Dutch East Indies fell off in the first five months of 1924, though not so sharply as United States exports except in the case of France, where prevailing tire prices no longer permit profit in the trade even when goods are entered under the more favorable tariff rate accorded to Canada. Canadian shipments to British South Africa increased very greatly, the change made in tariff rates in 1923 according more preferential treatment to Canadian products than the previous tariff. It is difficult to determine why Canada's New Zealand trade has fallen off, while the Australian trade has increased, since the Canadian goods receive preferential treatment in New Zealand, but not in Australia. The New Zealand trade of American firms is meeting increased competition from Australian Dunlop cord tires first placed on the market in 1923. American firms are shipping to Australia from Canadian plants to a greater extent this year than last, and a similar trend is noticeable in the trade with Denmark. Canadian shipments to Japan were heavy during the early months of 1924 but were much smaller in April and May.

There are certain factors tending to aid future American tire exports. It will not be long before American firms will be offering 31 x 4.40 clincher balloon tires to compete with the popular Michelin product in certain markets. It will be necessary, however, to produce such a tire at a competitive price, and since the American balloon tire development is along the lines of a three- or four-ply casing while the Michelin casing has but two-plies, this may not be easy of accomplishment.

EDITOR'S REVIEW DESK

Trade Catalogs **Books** **Articles**

THE BLACK ART OF RUBBER COMPOUNDING. Chat No. 9. 5 x 8 inches. 24 pp. Illustrated with halftone plates and reproductions of graphs. Binney & Smith Co., 41 East 42d St., New York, N. Y.

Some excellent arguments for the use of Micronex in the manufacture of wire insulation are set forth in this attractive booklet. "As is the case in practically all lines of rubber manufacture, the insulated wire compounder is profitably utilizing a leaf from the tire man's book. The pneumatic tire cover or tread stock, with its toughness, resilience, and remarkable resistance to abrasion, has now also become the outside cover of many important classes of insulated wire."

The use of Micronex in tire treads is then taken up and the history of thread compounding sketched in brief. Typical formulas are given and discussed. Many problems arose in developing present thread stocks. Formulas changed. A formula is given which shows to a nicety the change which took place in compounding in a decade.

Other pigments are not neglected in the treatise. China clays, zinc oxide, thermatonic carbon and Kadox are afforded their share and graphs are used to illustrate the tenacity of each as shown by stress strain curves. A section is also devoted to softeners, principally mineral rubber, hardwood pitch, palm oil and paraffin. The subject of accelerators is dismissed with a paragraph because "the subject is a large one and space limitation makes it impossible to do so." But the rubber development and service department of the Binney & Smith Co., which now has a compounding laboratory in operation, welcomes specific accelerator problems and gives disinterested advice. Manufacturers are offered every resource of this large company in selecting the accelerator, in setting the ratio of accelerator and sulphur to rubber and in checking the condition of vulcanization of the cure.

The final section is devoted to the manufacture of Micronex. Shipments are made direct in carload lots from factories located in West Virginia, Kentucky, Louisiana, Oklahoma and Wyoming. Smaller quantities are shipped from stocks carried in New York, Chicago, Akron, San Francisco and Los Angeles.

No manufacturer or technical man employed in the wire insulation industry should deny himself the pleasure and enlightment to be gained by a perusal of this booklet.

* * *

VULCANIZATION ACCELERATORS. Bulletin No. 1. Di-ortho-Tolylguanidine and Its Uses. 3¾″ x 6¾″. 20 pp. Published by E. I. duPont de Nemours & Co., Inc., Dyestuffs Department, Sales Division, Wilmington, Del., and 8 Thomas St., New York, N. Y.

This is the first of a series of similar booklets on accelerators giving detailed information concerning the important ones manufactured by the duPont company.

Di-ortho-Tolylguanidine has been developed as an organic accelerator quite recently. It is closely related to diphenylguanidine which has been employed in rubber factories for several years and has replaced certain accelerators in many factories chiefly because it is non-poisonous, causes no objectional odor in the cured stock, and can be used advantageously with low percentages of sulphur to produce compounds said to have thoroughly satisfactory aging qualities.

The history of disubstituted guanidines is traced back to the early years of organic chemistry; the manner of preparation of the accelerator and the vulcanization reactions of Di-ortho-Tolylguanidine are described. Specifications, general physical and chemical properties and compounding characteristics of the new accelerator are each given attention in the booklet. Factory control is discussed fully. The comparison of Di-ortho-Tolylguanidine with diphenylguanidine occupies several pages as does its comparison with hexamethylenetramine. Graphs add interest to the exposition.

This bulletin may be read with profit by every rubber chemist.

* * *

BULLETINS. Loose leaf binder. 7½″ x 10½″. 2, 4, 8 and 10 pp. American Hard Rubber Co., 11 Mercer St., New York, N. Y.

These bulletins, which are printed on high-grade coated paper and profusely illustrated with fine-screen halftone engravings, describe the hard rubber equipment that is made by the company especially for use in certain industries. Highly corrosive liquids used in the silk dyeing industry, in photography and photo-engraving, and in many chemical industries necessitates the use of hard rubber apparatus and utensils, which have been found to be the most economical. For instance, in the silk dyeing industry stannic tetrachloride attacks all commercial metals but has no effect on hard rubber of a certain grade.

Again, in the handling of fruit juices, vinegar and other food products small amounts of metal dissolved from tanks, pumps, piping and other utensils have a noticeably deleterious effect both on flavor and color. The use of solid hard rubber or hard rubber in combination with metal has manifold advantages in such cases. The American Hard Rubber Co. manufactures tanks, utensils, various kinds of pumps and special articles of hard rubber, made to specifications or blue prints.

* * *

ARE YOU AGING RUBBER? Folder. 3 x 5¾ inches. 6 pp. The Thermo Electric Instrument Co., Newark, N. J.

This little folder deals with the new Freas Aging Oven, said to have improved circulation of air, providing a uniform and constant temperature in all parts. The oven has a thermo regulator which automatically maintains a constant temperature. The thermo regulator employed is said to be a sensitive differential linear expansion thermostat, made entirely of metal, in which all motion is rectilinear, insuring positive action. The thermostat may be set without opening the oven.

The Freas Aging Oven is intended for use in the Geer-Evans and similar life tests, involving accelerated aging at uniformly constant temperature of 158° F. in circulating air for periods ranging from three to twenty days.

* * *

YEAR BOOK AMERICAN ENGINEERING STANDARDS COMMITTEE, 1924, 64 pp. 7¾ x 10⅛.

The American Engineering Standards Committee, embraces the principal national organizations and governmental departments interested in standardization activities, and its Year Book for 1924 in a carefully prepared summary shows the great growth and scope of the movement, its development, agencies, purposes, history and method. Among the projects which had an official status before the Committee on March 31, 1924, is the Safety Code for Rubber Machinery, sponsored by the International Association of Industrial Accident Boards and Commissions. Lists of cooperating bodies, sustaining members and member bodies and representatives are also given in this publication.

VULCANIZATION & ACCELERATORS

By Andre Dubosc

PART 1 (*CONTINUED*)

Theory of Vulcanization

Bernstein Showed Rubber Must be Depolymerized Before Vulcanization Can Take Place—One of the Results of Vulcanization is an Increase in the State of Polymerization of the Rubber Molecule

ACCORDING to Bernstein, before vulcanization can take place, before there can be any chemical combination whatsoever between the rubber gum and sulphur, depolymerization of the rubber must take place. Hence the physical conditions of the rubber is changed in accordance to the following equation:

$$(C_{10}H_{16})n = n\,C_{10}H_{16}.$$

All the various chemical agents which are used to bring about the depolymerization of the rubber gum, will reduce the viscosity of its solutions as well, which is always the same for all the different types of depolymerized rubber, whatever may be the means that are used in effecting the depolymerization of the rubber.

If the rubber is mixed with sulphur, all the chemical reagents and other agencies which are able to bring about its polymerization, cause the vulcanization of the rubber as well. This is what takes place when a solution of sulphur and rubber is exposed to the action of ultra violet light. In this case the viscosity of the rubber solution increases.

The procedure is the same in ordinary vulcanization. Heat depolymerizes the gum and the action of the sulphur is just the reverse, it repolymerizes it.

Depolymerization by Means of Ultra Violet Light

As far as the particular action of the rays of ultra violet light are concerned, the hypothesis advanced by Bernstein is in accord with the facts that were observed by his master, Victor Henry, who stated as early as in 1909 that rubber depolymerizes when subjected to the rays of ultra violet light and that the viscosity of its solutions is decreased.

On the other hand it has been observed by Bernstein that if a mixture of rubber and sulphur is subjected to mastication between rolls heated to a temperature of 80 degrees C, the action of vulcanization commences immediately and 0.8 per cent of the sulphur becomes insoluble and combines with the rubber.

Then if the same mixture of rubber and sulphur is directly subjected to that temperature in a heating chamber, without first being calendered between the mixing rolls, then no fixation of the sulphur takes place at all.

Thus if the phenomenon of vulcanization can take place in the first case, it is only because the mechanical operation of mastication has resulted in the depolymerization of the rubber and has thereby converted it into such a condition that it is able to fix the sulphur.

Effect of Heat on Pure Rubber

If the pure rubber gum is heated to a temperature of 120 degrees C, it is polymerized in part. If sulphur is then added to the rubber and then the mixture is placed in a heating chamber, maintained at a temperature of 80 degrees C vulcanization of the rubber ensues. In other words the results are the same as those which were produced in the case of the mixture of rubber and sulphur which was first masticated between heated mixing rolls before being heated. The same quantity of sulphur is fixed by the rubber in the experiment in which the sulphur is added after preliminary heating to 120 degrees C as when the rubber-sulphur mixture is first calendered.

In accordance with the observations of Bernstein and Heilbronner, if a solution of rubber and sulphur is subjected to the action of actinic rays of light, the rubber in the solution will be vulcanized and will fix or combine with 0.6 per cent of sulphur. But it is a curious fact that although this rubber gum is vulcanized, nevertheless it remains soluble in the solvent that was used to dissolve the raw rubber before vulcanization. According to the views that are held by Bernstein, the action of sulphur in the vulcanization of rubber is foremost that of catalysis. In other words the sulphur is the substance that causes the repolymerization of the rubber. This action can be caused by means of very small amounts of sulphur. Hence, that percentage of rubber that is combined with the rubber in the vulcanized condition is not a measure of the degree of vulcanization as has been held by Weber.

Action of Physical Agents on Viscosity

Physical agents, such as the ultra violet light rays, in acting upon the rubber mass, bring about a decrease in the viscosity of the rubber solution. In other words it causes the depolymerization of the rubber molecule. On the other hand the action of these same agents on the sulphur that is in solution is just the contrary. They cause the polymerization of the metalloid and convert it into a colloidal insoluble product. Hence the manner in which these physical agents, for example the ultra violet light, act on a mixture of rubber and sulphur in solution is at one and the same time the opposite of each other. From this reasoning it is therefore deducted that the gum, which has been depolymerized, adsorbs the insoluble colloidal sulphur. It is this phenomenon of the adsorption of modified sulphur which is the cause of the vulcanization of rubber. The transformation of the sulphur and the depolymerization of the rubber molecule are thus the primary causes of the phenomenon of vulcanization.

The change that takes place in the vulcanized rubber article is therefore due to the continuation of the depolymerization process under the influence of certain physical agents, such as light, and also of the increase in the degree of polymerization of sulphur which is caused by the same influences.

The Lothar Weber Theory

Vulcanization of rubber is effected through the action of sulphur and the subsequent application of heat. This action is characterized by a change in the physical and chemical properties of the rubber molecule.

In the first place, a chemical combination takes place between the molecule of sulphur and the molecule of rubber, which in other words simply means that vulcanized rubber contains sulphur in chemical combination, and that this sulphur cannot be removed from the rubber without destroying it or decomposing it. In the second place, and this is the most important reaction of all that takes place in this process of vulcanization, the vulcanization of the rubber results in an increase in the degree of the polymerization of the rubber molecules. This is considered as being an increase in the state of aggregation of the molecules. The phenomenon of polymerization is understood to mean the process which permits the uniting of a certain number of molecules of small dimensions into one single molecule.

Nature of Polymerization

During the course of the polymerization process and at its close no new elements are formed and the proportions of the different elements of the substance which polymerize are not changed. Hence, it is a phenomenon which may be said to belong to the physical class.

For example, consider the polymerization of a known substance, such as, isoprene, the starting point in the manufacture of synthetic rubber. As is known, by polymerization this substance is eventually converted into rubber. The constitution of the substance, isoprene, is represented by the molecular formula, C_5H_8. Hence it contains five atoms of carbon and eight atoms of hydrogen. When isoprene is polymerized, its composition remains the same, with this exception, namely, that the result of the polymerization is a substance, which contains a number of the complexes, C_5H_8, which are combined together to give a larger molecule, whose formula may be written as : $(C_5H_8)n$. This polymerization is therefore an increase in the state of aggregation, a large number of small entities combining together to give one single entity of large volume.

Vulcanization not Chemical Combination Only

It is thus evident that the action of vulcanizing rubber is not merely one of its combination with sulphur. Polymerization takes place at the same time as the sulphuration of the rubber. It is possible to show this by various experiments.

Although it is actually impossible to determine the absolute degree of polymerization that takes place in the rubber molecule, nevertheless it may be said that, when it comes to considering the matter from the basis of the absolute volume of the molecule, it is fairly easy to establish the degree of polymerization that has taken place in it. In fact this condition of the rubber molecule may be determined by measuring the viscosity of the dissolved substance. The more the solution of the gum, the more complex the state of aggregation of the dissolved substance, and accordingly, the higher its degree of polymerization.

Polymerization and Vulcanization

It has been shown by Bernstein, as has been indicated above, that when a mixture of sulphur and rubber is exposed to the action of the ultra-violet rays of light, vulcanization ensues, and when a solution of the rubber and sulphur is exposed to the same action, then the viscosity of the solution is increased. Then, if the solvent is evaporated and the combined sulphur is weighed, it is possible to state from the results obtained that actual vulcanization has taken place. Thus the conclusion is reached that vulcanization of rubber is accompanied by an augmentation in the viscosity of its solution, and it follows logically therefrom, that one of the results of vulcanization of rubber is the increase in the state of polymerization of the rubber molecule.

Axelrod has shown that the vulcanization of rubber is accompanied by an increase in the polymerization of the rubber molecule, and hence one of the best methods that are known for obtaining polymerization of isoprene to give rubber is to work with it in the presence of sulphur.

The polymerizing action of sulphur on rubber can also be demonstrated by making a comparative study of vulcanized rubber and of virgin rubber when dissolved under different conditions. In the first place, let us examine, for example, the solubility of a virgin rubber in chloroform, after it has first been treated with acetone.

It is found to be totally soluble. Then if the same experiment is carried out with a sample of rubber that has been slightly vulcanized, it is established that the solubility of the rubber decreases to a slight degree. But, on the other hand, the viscosity of the rubber solution increases to a considerable degree. Then if the degree of vulcanization is increased, it is found that the solubility of the rubber diminishes and that this relation between degree of vulcanization and solubility is an inverse one. Finally the point is reached where the rubber is no longer soluble. As long as it is possible to dissolve the vulcanized rubber product, it may be stated that the viscosity of the solution increases as a direct function of the degree of vulcanization, and consequently that the degree of polymerization undergoes a similar increase.

The conclusion that may be reached from these observations is that when the vulcanized rubber has become insoluble in the regular solvents used for dissolving vulcanized rubber, it attains its maximum degree of polmerization in the molecule.

Modification of Polymerization and Solubility

If it is desired to again dissolve the vulcanized rubber, then it is first necessary to change the state of polymerization of the rubber molecule. This can be done in a practical manner by subjecting the rubber to the action of heat, which renders it partially soluble in chloroform. The chloroform solution which is obtained in this manner possesses the same composition as the vulcanized rubber and the relationship that exists between the different constituents in the vulcanized rubber in the state of solution in chloroform is the same that holds good for the solid rubber gum. The difference lies merely in the fact that when it is dissolved, it gives a solution which has a lower viscosity than a corresponding solution of virgin rubber. Hence it is a substance which is in a very slight state of aggregation; in other words, the molecule is only slightly polymerized.

If the chloroform extract of the vulcanized rubber is mixed with sulphur and subjected again to vulcanization, a substance is obtained which possesses all the characteristic properties of vulcanized rubber.

The reduction in the breaking load and degree of elongation, which are observed after a prolonged mastication, do not appear to be due to a change in the tensile strength curve. It is seen to be only a shifting of the end portion of that curve.

The Proportion of Combined Sulphur

As far as the same mixture is concerned, the quantity of sulphur that enters into combination with the rubber molecule is approximately proportional to the time expended in the vulcanization of the rubber, at any given temperature, while in the case of mixtures which contain from two to ten per cent of sulphur, the proportion of combined sulphur, when the time of vulcanization is maintained constant, is approximately proportional to the original percentage of sulphur in the rubber mixture.

Between the temperatures of 130 and 150 degrees C, the temperature coefficient of the vulcanization process has a value lying between 2 and 3. A rubber which has a high viscosity in solution tends to give a product possessed of greater mechanical resisting properties than one with a low degree of viscosity. This is due not only to the fact that in equal volume the degree of depolymerization to which it is subjected is less, but also because it vulcanizes more rapidly.

The resinous constituents of the rubber are not essential to vulcanization, although they seem to possess a certain degree of accelerating capacity on the process; on the other hand their presence in the rubber tends to lower the breaking strength of the vulcanized article. This observation which Van Rossem is almost the only one to champion is contrary to all the conclusions and remarks that have been hitherto made on this subject.

In summing up it may be stated that the vulcanization of rubber is a process in which the sulphur molecule and the rubber molecule enter into a chemical reaction, combine with each other chemically to give a new substance, with the net result that the molecules of the rubber gum are subjected to polymerizing phenomenon which greatly increases the molecular weight of the vulcanized product.

In the next issue M. Dubosc discusses the Harries and Fontrobert theory.—THE EDITOR.

TECHNICAL ABSTRACTS

Mechanical **Chemical** **Physical**

Oxidation Under Pressure in Aging

Previous investigators have well established the predominant role that oxygen takes in the natural aging of rubber. By employing oxygen under pressure the rate of oxygen may be greatly accelerated at temperatures only slightly above normal.

Experiments have shown that vulcanized rubber on exposure to dry oxygen under a pressure of approximately 300 pounds per square inch at a temperature of 50° to 60° C for 16 to 24 hours shows deterioration almost identical to that resulting from several years of natural aging. Chemical examination of vulcanized rubber after oxidation under pressure shows that the deterioration is similar to the effect of natural aging. In each case the rubber hydrocarbon is oxidized and the oxidation products are extractable with acetone.

That oxidation under pressure and oxidation due to natural causes bear a close relationship to each other is further emphasized because: (1) The presence of moisture retards the deterioration in both cases. (2) The deterioration action of oxygen under pressure is reduced in the presence of antioxidants, a fact which parallels the influence of these substances under natural conditions of aging. (3) The presence of sulphuric acid in vulcanized rubber and compounds of manganese and copper increases enormously the deteriorating action of oxygen both under pressure and in natural aging.—J. M. Bierer and C. C. Davis, Boston Woven Hose & Rubber Co., Boston, Mass., writing in the July issue of *Industrial and Engineering Chemistry.*

Effect of Mold on Rubber

The effect of mold on sheet rubber which has been compounded with litharge is discussed in an article published in the *Bulletin of the Rubber Growers' Association,* volume 5, pages 341 to 342. Two samples of sheet rubber were prepared, one by coagulation of rubber latex with the aid of acetic acid, and the other by coagulation with the aid of sodium silicofluoride. The sheets in this case are further soaked in a saturated solution of the same salt. Under conditions, which caused the former sample to become covered with mold, the latter remained free from the same. With sulphur alone the rubber vulcanized more rapidly, but in the additional presence of litharge, which was added in the proportion of fifty parts to ten parts of sulphur and ninety parts of rubber, the position was reversed.

Change in Colloidal State by Vulcanization

Calcined magnesia has been employed as an accelerator of vulcanization and good results have been obtained by its use. A marked change in the character of the rubber takes place when this substance is used, and the purpose of the investigation which is reported in *Kolloidchem. Beih.,* 1924, volume 19, pages 47-71 is to arrive at an explanation of the alteration in the colloidal conditions of the rubber by vulcanization and also by accelerated vulcanization with magnesia as the accelerator.

When introduced into rubber, calcined magnesia enters into chemical combination with the non-caoutchouc constituents. The result is that the portion of the rubber which is soluble in acetone is reduced by approximately fifty per cent. At the same time the rubber undergoes a change in physical properties. For example, its viscosity is changed in somewhat the same manner as by ordinary vulcanization. This independent effect of the magnesia persists in the presence of sulphur and explains the high degree of physical alteration relative to the degree of chemical change on vulcanization with the aid of calcined magnesia.

The attainment of a maximum tensile strength in the vulcanized product with subsequent "reversion" on prolongation of the heating in the presence of a limited percentage of sulphur is associated with a similar change in the proportion of sulphur in combination with the natural accelerator of the rubber. Raw rubber is a sol which by vulcanization is converted into a gel consisting of an open network of connected and inter-penetrating phases, of which phases those of the natural and artificial accelerators or their reaction products are of especial importance as the solid framework of the gel and the seat of elasticity.

Composition for Sealing Tires

British Patent No. 185,114 is concerned with a process of manufacturing a composition which may be used for sealing holes in tires and also for preserving rubber articles. The compound is used for automatically sealing punctures and is prepared by mixing concentrated waste sulphite liquor with a binding agent, such as a gum and various earthy ingredients such as talc. Pine oil may be used in part or in whole in the place of waste sulphite cellulose liquor. The proportions employed in making this compound are from forty to fifty parts of the waste sulphite cellulose liquor, from six to ten parts of the gum and from fifty to sixty parts of talc.

Vulcanizing Rubber

Trisubstituted thioureas, particularly mixed aromatic aliphatic thioureas of the general formula, S : C (NR′₂) (NHAr) and S : C (NR″) (NHAr), where R′ is a univalent alkyl radical, R″ a bivalent open or close chain alkylatede radical, such as pentamthylene, and Ar is a univalent aryl radical, are used as accelerators in the vulcanization process. Such tertiary thioureas give better results than the primary and secondary compounds, in that by their use vulcanization is effected in a shorter time and at a lower temperature, the products are more resistant to wear and tear and mechanically stronger, and the risk of premature vulcanization during mixing, etc. is lessened. The compounds are prepared by the condensation of aryl thiocyanates with secondary aliphatic or alicylic bases, and are solid crystalline substances, easily miscible with rubber and sulphur.(British Patent No. 201,912.)

Rubber Latex in Paper Making

The addition of rubber latex to paper has a very favorable effect on the resistance to folding, the influence steadily increasing with gradual increase of the rubber content of the paper from four to twenty per cent. The breaking extension of the paper is increased by the presence of rubber, as is also the resistance to water and to dilute aqueous solutions of sodium hydroxide. However, the strength of the paper is reduced to some extent. Although wet latex-sized paper is much whiter than a comparable paper without rubber, it becomes yellowish in the dry state. The mechanical properties and the rubber content of latex-sized paper undergo no alteration on storage for a month in the dark. *Papier Fabrikant,* 1924, volume 22, pages 129-132.

Soft Rubber Manufacture

A filled rubber product which has been subjected to the action of two reagents, one of which is sulphur and the other a soluble condensation product of the phenol-formaldehyde type is manufactured in accordance with the directions given in United States Patent No. 1,493,062 The percentage of sulphur is fixed as less than five per cent of the total rubber sulphur mixture.

RUBBER STATISTICS

Import **Production** **Export**

Importations of Crude Rubber into the United States During July, 1924

Figures compiled and distributed by The Rubber Association of America, Inc.

(Estimated net weights—long tons.)

PLANTATIONS

FROM	TONS
Batavia	744
Belawan-Deli	1,167
Colombo	1,166
Hamburg	36
Liverpool	157
London	947
Malacca	977
Penang	1,695
Pt. Swettenham	881
Rotterdam	37
Singapore	9,500
Sourabaya	1,083
	18,390

AFRICANS

FROM	TONS
Antwerp	45
Bordeaux	26
Liverpool	54
Southampton	45
	170

CENTRALS AND GUAYULE

Centrals (Mexico and Central America)	43
Guayule (Mexico)	167
	210

PARAS

Bahia	1
Iquitos	2
Manoas	673
Para	523
	1,199

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons		Tons
Waste	50	Miscellaneous Gums	1,335
Balata	26		

COMPARISON 1923-1924

	JULY-1923	JULY-1924	Total Importations 7 months ending, July 31 1923	1924
Plantations	17,459	18,390	196,406	165,201
Paras	636	1,199	8,524	7,010
Africans	146	170	2,763	1,461
Central	23	43	292	398
Guayule	328	167	637	715
Manicoba and Matto Grosso	17	..	26½	..
	18,609	19,969	208,648½	174,785

Note: 1502 tons Plantations not reported last month included in above.

ARRIVALS PLANTATIONS FOR JULY, 1924, SHOWING PORTS OF ORIGIN AND ARRIVAL

FROM	ARRIVED AT	TONS
Batavia	Boston	7
Batavia	New York	737
Belawan-Deli	New York	1,167
Colombo	Boston	10
Colombo	New York	1,156
Hamburg	New York	36
Liverpool	New York	157
London	New York	947
Malacca	Boston	14
Malacca	New York	963
Penang	Boston	209
Penang	Los Angeles	10
Penang	New York	1,476
Port Swettenham	Boston	21
Port Swettenham	New York	860
Rotterdam	New York	37
Singapore	Baltimore	957
Singapore	Boston	451
Singapore	Los Angeles	249
Singapore	New York	7,843
Sourabaya	Boston	10
Sourabaya	Los Angeles	16
Sourabaya	New York	1,057
		18,390

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports		
Baltimore	957	
Boston	722	
New York	16,436	
		18,115
Pacific Ports		
Los Angeles	275	
		18,390

Rims Inspected in June and July

Size	JUNE Number	Pct.	JULY Number	Pct.
Clincher Rims:—				
26 x 3	6,580	0.5	3,999	0.4
28 x 3	996	0.1	484	0.0
30 x 3	141,272	3.0	33,382	2.1
30 x 3½	628,816	45.5	697,492	54.3
31 x 4	27,565	2.0	none	..
Straightside Rims:—				
25 x 3½	none	..	219	0.0
28 x 3½	47,357	3.4	107,658	7.3
29 x 3½	none	..	none	..
30 x 3½	108,615	7.8	73,479	6.9
32 x 3½	1,752	0.1	3,362	0.3
28 x 4	72,279	5.3	63,605	4.0
29 x 4	45,034	3.2	39,739	3.1
30 x 4	63,894	4.6	10,736	0.8
31 x 4	none	..	none	..
32 x 4	102,282	7.4	65,740	5.1
33 x 4	2,363	0.2	6,129	0.6
34 x 4	none	..	none	..
29 x 4½	17,691	1.3	14,738	1.1
30 x 4½	45,911	3.4	62,820	4.2
31 x 4½	9,958	0.7	47,475	3.4
32 x 4½	77,872	5.8	78,996	5.7
34 x 4½	5,770	0.4	7,833	0.6
36 x 4½	none	..	1,077	0.1
30 x 5	2,315	0.2	4,561	0.3
31 x 5	12,620	0.9	15,072	1.5
33 x 6	1,210	0.1	3,046	0.3
Truck Rims:				
30 x 5	5,821	0.4	496	0.1
34 x 5	4,551	0.3	6,030	0.4
32 x 6	3,557	0.3	1,900	0.2
36 x 6	2,400	0.2	2,056	0.2
34 x 7	877	0.1	1,085	0.1
38 x 7	1,101	0.1	103	0.0
36 x 8	918	0.1	5	0.0
40 x 8	833	0.1	1,492	0.1
	1,381,756		1,316,168	

Market for Waste Rubber in Spain

The inhabitants of the interior rural sections of the Barcelona district, well over a million in number, live an isolated existence. Their pursuits are chiefly agricultural and carried on by antiquated methods. Living largely to themselves, and having only enough to provide for the bare necessities of life, they naturally give little thought to appearance in the matter of dress, and are always receptive to little economies that will reduce living expenses in the slightest degree.

For a long time the footwear in general use in the country districts has been the cheap rope-soled alpargata, but in recent years a new sort of shoe, known as the abarca, made from sections of discarded automobile tires, imported chiefly from the United States, England and Holland, has been gaining steadily in popularity. The use of canvas rubber-soled footwear made from imported waste inner tubes, and rubber heels, made from waste solid rubber tires, has also become much more general in recent years both in the rural sections and the cities.

The great bulk of waste tires imported into Barcelona is used in the fabrication of abarcas; old solid tires are used principally for rubber heels; and the old inner tubes are devoted largely to the making of soles for cheap canvas footwear, and also for cheap rubber belts, garters, and toy balloons.

According to the Department of Commerce, the United States exports of scrap and old rubber to Spain, which amounted to 1,504,198 pounds valued at $110,153 in 1922 and 3,465,013 pounds valued at $225,312 in 1923, constitute about one-third of this class of goods, and inasmuch as the Spanish market appears to be one capable of considerable expansion, American exporters should be interested in learning something of the industries on which this trade is based, size of the market, and competitive considerations affecting this market.

MARKETS

Cottons and Fabrics

August 15, 1924

Although the market during the past two weeks has shown considerable activity with prices fluctuating from day to day, present quotations differ only slightly from those on the first of the month, the former showing an approximate loss of one and one-half cents.

On the 4th with the southern markets reporting only scattered selling here and there and with the local market featured by speculative business, prices eased off from 29 to 38 points lower than Saturday. The absence of the Liverpool market, which was closed on account of the bank holiday also tended to create an easier tone here. On this date several private crop reports were brought out, one predicting a condition of 69.6 and an indicated yield of 12,718,000 bales while another placed condition at 67.6 with a yield of 12,275,000 bales. With the Liverpool exchange opening on the 5th with a decline both for spots and contracts and this market showing an opening decline of 20 points, little business of any great volume was reported during the day, with closing quotations noting a recovery in prices due to advices received that considerable deterioration was taking place in cotton plants in the drought sections.

The Department of Agriculture in its semi-monthly report placed condition at 67.4 on August 1st with an estimated yield for the year of 12,354,000 bales, an increase of 420,000 bales as compared with last month and 854,000 bales more than 1923. On the heels of this report the market declined approximately one cent due to heavy liquidation.

The Commerce Department from data received in recent cables announced that Egyptian cotton exports during July declined 2,603,000 pounds as compared with June with stocks on hand on July 31st amounting to 38,044,000 pounds. American cotton exports also show a falling off, with shipments during the week ended August 8th totaling 15,368 bales as against 33,330 bales during the same period last year.

On the 11th, with Liverpool showing no definite weakness in face of the Washington report on the preceding Friday, considerable covering by many factors in the trade took place and prices at the closing session were 14 points higher and 4 points lower than on Saturday, sellers asking 27.43 for the October position. January was quoted at 26.85 and March at 27.08. Private advices on the 12th, reflecting plant deterioration in sections which have had comparatively little rain during the past six weeks, brought about heavy buying during the day with the largest volume of business passed in two weeks. Demand for contracts came from both domestic and foreign centers with London a heavy buyer. At the close the market showed a gain of from 90 to 98 points. On the following day, however, heavy selling was encountered in the market due to private advices of heavy rains in northern and central Texas. The weakening of the Liverpool market due to reselling of cotton covered the previous day tended to weaken both New York and New Orleans and as a result closing quotations showed a net loss during the day of 111 to 118 points.

The British Cotton Growing Association reports excellent progress in production in all sections of the Empire where cotton is grown. In the Punjab an increase of from 300,000 to 550,000 acres is reported while in the Northeastern Provinces of Nigeria production continues to increase steadily. The association has also expressed the opinion that inasmuch as most of the cotton now being produced in the British Empire is grown from American seed, it is equal in quality to the average American type.

Closing quotations of this date follow:

	Open	High	Low	Aug. 15 Closed	July 31 Closed
October	27.45	27.50	26.82	26.83	28.81
December	26.90	26.90	26.20	26.20	28.09
January	26.70	26.75	26.06	26.10	27.80
March	26.95	27.00	26.35	26.42	28.20
May	27.05	27.17	26.50	26.60	28.10

TIRE FABRICS

Recent reports from factors in this trade would indicate a more stabilized market with prices being well maintained by sellers. Over the last ten days the volume of business has been encouraging and not a few of the mills report being well booked up into next year.

During the last week several of the larger tire factories have requested mills to forward their September deliveries during August which fact tends to create an optimistic feeling in the trade that the situation is better and at the same time brightens future business to a great extent.

A number of fabric mills who have been out of the market for some time are beginning to feel more optimistic as regards placing business in 1925 inasmuch as the majority of orders placed today do not run beyond March. This attitude is also based on the fact that the new equipment situation is showing considerable improvement due to the decline in production which brought about a better adjustment in supply and demand. Tire sales still continue to improve with some of the larger factors in the tire industry reported to be increasing their production from time to time.

Although buyers in the market for the most part find sellers anxious to do business, few concessions are being made, and with old stocks being well liquidated and mills unable to show a profit at today's prices on material made up from cotton purchased at its present high level, the general opinion is that higher prices will be forthcoming in the near future.

For Carded Peeler Cord 23/5/3 ply 57c to 58c is the general asking price today with orders from 50,000 pounds to 100,000 pounds reported to have been placed at 55c and 56c. Combed Egyptian coming in for fair business in the manufacture of balloon tires is still quoted at from 68c to 70c with this grade in a quantity way possible to be obtained at 67½c in some directions. The price for Square Woven continues to run from one to two cents below cords for all grades.

A recent report issued by The Rubber Association showed that tire inventory, production and shipment figures during June were considerably less than during the same period last year, while a marked falling off was also noted for the six months period. The report further showed a decrease in exports of 59.2 per cent in June, 1924, as against June, 1923.

CORD FABRICS

Combed	Sakellarides	lb.	Nominal		
Combed	Peeler	lb.	Nominal		
Carded	Peeler	lb.	.57	@	.58
Combed	Egyptian uppers	lb.	.68	@	.70
Carded	Egyptian uppers	lb.	.63	@	.65

SQUARE WOVEN

17½-ounce	Egyptian uppers, combed	lb.	Nominal		
17¼-ounce	Egyptian uppers, carded	lb.	.62	@	.65
17½-ounce	Sakellarides, combed	lb.	Nominal		
17¼-ounce	Peeler, carded	lb.	.55	@	.57

(Continued on Page 392)

WEEVIL HIBERNATES IN COTTON STALKS

The agricultural bureau of the Chamber of Commerce as part of its 1924 production campaign is now urging cotton growers to destroy stalks and make a general clean-up of fields and ditch banks in order to reduce any cover in which the weevil might find protection during the winter months.

By so doing satisfactory results have already been obtained by one section in Texas which reports a 64 per cent increase in production above the average for the preceding three years.

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, Aug. 15, 1924—Considerable improvement in the market has taken place during the first two weeks of this month with the volume of business passing exceeding anticipations in many cases. Prices for most items remain nominally unchanged from previous quotations but few concessions are being made by sellers. Buyers are still inclined to purchase their requirements cautiously and shop for the lowest price obtainable. The opinion has been expressed by many in the trade that if demand continues at its present rate the fall months will see a decided stiffening in the market with a possible advance in prices, and several items which are at the present time below normal in consumption will meet with a decided increase in activity.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90 @	.95
Aniline oil, drums	lb.	.17 @	.17½
Diphenylguanidine	lb.	1.10 @	1.15
Excellerex,	lb.	.35 @	.40
Formaldehyde-Aniline	lb.	.40 @	.42½
Hexamethylene-tetramine	lb.	.82 @	.85
Paraphenylenediamine	lb.	1.40 @	1.50
Super-Sulphur No. 1	lb.	.50 @	.60
Super-Sulphur No. 2	lb.	.25 @	.35
Tetramethyl— Thiuramdisulphide	lb.	6.00 @	—
Thiocarbanilide, kegs	lb.	.26 @	.29
Vulcocene	lb.	.35 @	—

Inorganic

Lead, sublimed blue	lb.	.11 @	—
Lead, white	lb.	.09¾ @	—
Litharge, domestic	lb.	.10 @	—
Lime, Superfine	lb.	.02 @	.04
Magnesia, calcined, light,	lb.	.15 @	.18
extra light	lb.	.20 @	.24
heavy	lb.	.04 @	.05

COLORS

Blacks

Arrow "Aerfloted"	lb.	.07 @	.10½
Bone Black	lb.	.08 @	.11
Carbon "	lb.	.09 @	.12
Drop "	lb.	.07½ @	.10
Ivory "	lb.	.15 @	.45
Lamp "	lb.	.12 @	.40
Micronex	lb.	.08½ @	.12

Blues

Cobalt	lb.	.52 @	.56
Prussian	lb.	.36 @	.39
Ultramarine	lb.	.06 @	.35

Browns

Iron oxide	lb.	.02¼ @	.06¼
Sienna, Italian,	lb.	.04½ @	.14
Umber, Turkey,	lb.	.04 @	.04½
Vandyke, domestic	lb.	.03½ @	.04

Greens

Chrome, light	lb.	.29½ @	.31
medium	lb	.32 @	.35
dark	lb.	.35 @	.38
Commercial	lb.	.10 @	.10½

Reds

Antimony crimson, 15/17 F.S.	lb.	.37 @	.44
sulphur free	lb.	.45 @	.60
golden, 15/17 F.S.	lb.	.20 @	.22
calcium and sulphur free	lb.	.40 @	—
red sulph. 15-17 F.S.	lb.	.16 @	.20
Indian, English	lb.	.11 @	—
Para toner	lb.	.95 @	1.00
commercial	lb.	.15 @	.18
Red Oxide, reduced	lb.	.08 @	.12
pure	lb.	.12 @	.14
Toluidine toner	lb.	1.85 @	2.10
Venetian red	lb.	.02 @	.05½
Vermillion, quicksilver, English	lb.	1.25 @	1.35
domestic	lb.	.15 @	.25

Whites

Albalith	lb.	.07 @	.07¼
Aluminum bronze		.55 @	1.25
Lithopone Azolith	lb.	.06⅛ @	—
Zinc Oxide—American Process XX red	lb.	.07⅝ @	.08¼
Kadox, black label, bags, cars		.11⅝ @	.11⅞
blue " " "		.10⅝ @	.10⅞
red " " "		.09⅝ @	.09⅞
American Azo: ZZZ (lead free)	lb.	.07¾ @	.08¼
ZZ (under 5 per cent leaded)	lb.	.07 @	.07½
Z (8-10 per cent leaded)	lb.	.06¾ @	.07¼
Zinc Oxide—French Process White seal	lb.	.12 @	—
Green seal	lb.	.10¾ @	—
Red seal	lb.	.09¾ @	—

Yellows

Chrome, light		.17 @	.18
dark and medium	lb.	.17 @	.18
Cadmium Sulphide	lb.	1.50 @	1.60
Ocher, French	lb.	.01⅞ @	.03½
domestic	lb.	.01½ @	.02½

COMPOUNDING INGREDIENTS

Aluminum Flake	ton	25.00 @	40.00
hydrate light	lb.	.17 @	.18
Ammonia carbonate,	lb.	.13½ @	.14
Asbestine	ton	13.00 @	15.00
Barium carbonate	ton	65.00 @	68.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	15.00 @	18.00
Western prime white	ton	22.00 @	23.00
Imported	ton	28.00 @	33.00
Basofor	lb.	.04¼ @	—
Blanc fixe, dry f.o.b. works	lb.	.03¾ @	—
Carrara filler	lb.	.01½ @	.02
Chalk, precipitated, extra light	lb.	.04¼ @	.05
heavy	lb.	.03¼ @	.04
Clay, China, domestic,	ton	12.00 @	15.00
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	12.00 @	25.00
Fossil flour	lb.	.03 @	.05
Glues, extra white	lb.	.22 @	.30
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.28
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.10½ @	.12
Graphite flake, bbls.	lb.	.06½ @	.12
Lump	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid latex	gal.	1.25 @	1.35
Magnesia, carbonate	lb.	.08¼ @	.08¾
Mica, powdered	lb.	.07 @	.15
Rotten Stone (powdered)	lb.	.02½ @	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.17 @	3.27
Talc, domestic	ton	15.00 @	22.00
French	ton	20.00 @	25.00
French, high grade	ton	40.00 @	45.00
Italian	ton	50.00 @	55.00
Terra Alba	cwt.	1.75 @	1.90
Tripoli, white	lb.	.02 @	.02¼
Whiting, commercial	cwt.	.85 @	1.15
gilder's bolted	cwt.	1.10 @	1.20
English cliffstone	cwt.	1.50 @	—
Paris whiteAmerican	cwt.	1.25 @	1.50
Quaker	ton	13.00 @	15.00
Sussex	ton	8.00 @	16.00
Wood pulp XXX	ton	35.00 @	—
" " X	ton	25.00 @	—

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M.R.	ton	50.00 @	54.00
Hard hydrocarbon	ton	30.00 @	40.00
Soft hydrocarbon	ton	30.00 @	40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00 @	50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00 @	45.00
Synpro, granulated, M. R. (factory)	ton	55.00 @	70.00

SOFTENERS

Acids

Acetic, 28%	cwt.	3.12 @	3.37
Cresylic, 97%	gal.	.63 @	.68
95%		.61 @	.66
Muriatic, 20%	cwt.	.90 @	1.00
Nitric, 36 degrees	cwt.	4.25 @	4.50
Sulphuric, 60 degrees	ton	9.00 @	10.00
66 degrees	ton	14.00 @	15.00
Tartaric, crystals	lb.	.29 @	—

Alkalies

Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.43 @	1.45½

Oils

Castor, No. 3, bbls.	lb.	.16¼ @	—
Chinawood, bbls.	lb.	.14¼ @	.14½
Corn, crude, bbls.	lb.	.13¼ @	—
refined	lb.	.14½ @	—
Cottonseed, crude		.11½ @	—
Glycerine	lb.	.17½ @	.18
Linseed, Raw C.L.	gal.	1.02 @	—
Palm, Niger	lb.	.08 @	.08¼
Lagos	lb.	.08¼ @	.08½
Peanut, domestic, crude	lb.	.12½ @	—
Petrolatum, white		.12 @	—
amber		.05½ @	.06
dark amber	lb.	.05 @	.05½
Pine, steam distilled	lb.	.60 @	.65
Rapeseed, refined	gal.	.86 @	.87
blown	gal.	1.00 @	—
Rosin, first rectified	gal.	.40 @	.42
second rectified	gal.	.45 @	.47
Soya Bean, crude		.12½ @	—
Tar, commercial	gal.	.30 @	.32

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.10
soft	lb.	.09 @	.10
Parra M.R.	lb.	.06 @	.07
Tar Retort	bbl.	10.50 @	11.00
kiln burned	bbl.	10.50 @	11.00
Pitch, Burgundy	lb.	.65 @	.66
coal tar	gal.	.06 @	.08
pine	bbl.	5.50 @	5.75
Rosin grade K	bbl.	6.05 @	—
Shellac, Superfine orange	lb.	.58 @	.59

Solvents

Acetone, drums C.L.	lb.	.17 @	—
Alcohol, denatured, No. 1 bbls.	gal.	.52 @	.56
Benzol, 90%	gal.	.23 @	—
pure		.25 @	—
Carbon bisulphide	lb.	.06 @	.07
tetrachloride	lb.	.06½ @	.07
Dimethylaniline	lb.	.35 @	.37
Motor gasoline, steel bbls.	gal.	.19 @	—
Naptha, V. M. & P.	gal.	.17½ @	.18
Toluene	gal.	.31 @	—
Turpentine, spirits	gal.	.86½ @	.87½
wood	gal.	.74 @	.76

Waxes

Bayberry	lb.	.21 @	.22
Beeswax	lb.	.43 @	.45
Carnauba, No. 1	lb.	.33 @	.34
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb	.06 @	.06½
Ozokerite, black	lb.	.26 @	.27
green	lb.	.28 @	.29
Paraffine	lb.	.05⅜ @	.05½
White, A.M.P.	lb.	1.22 @	1.24
Sweet wax	lb.	.12 @	—

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.09 @	.15
Brown	lb.	.10 @	.15
Brown factice	lb.	.10 @	.15
White factice	lb.	.09½ @	.16

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.25 @	.26
Sulphur Chloride (drums)	lb.	.06 @	.07
Sulphur flour Commercial bags,	cwt.	1.35 @	1.70
" bbls.	cwt.	1.70 @	—
Superfine, bags,	cwt.	2.00 @	2.40
" bbls.	cwt.	2.30 @	2.75
100% pure, refined, bags	cwt.	2.35 @	2.65
bbls.	cwt.	2.60 @	2.90

Crude Rubber

NEW YORK, August 15, 1924

A continued advance in prices during the first two weeks of this month with a slight setback on the 13th and 14th have featured this market. Big consumers, although still inclined to make their purchases cautiously have been in the market for quantities of considerable size, and there is little reason to believe that they have as yet filled their requirements. The majority of the trade attribute the upward trend of the market more to a good demand during a usually inactive period against restricted supply at the source, together with agitation for careful production and individual action by the growers, than to the Stevenson plan for there is little doubt that without American buying support the plan alone would be unable to keep prices at high levels.

Recent advices from the Akron district indicate considerable improvement in the situation there. Dispatches state that the General Rubber & Tire Co. which anticipated an increase in production by a third has changed its plans and intends to install additional equipment to take care of larger production. Other reports from that center state that the B. F. Goodrich Co. has increased its present schedule of 18,000 tires to 20,000 tires a day while the Firestone Tire & Rubber Co. and the Goodyear Tire & Rubber Co. are also contemplating increased outputs. Further increases are looked for from several of the smaller factories.

From the automobile industry word comes that manufacturers are entering August with schedules calling for larger production inasmuch as sales have continued to show improvement, and many producers look for the agricultural districts to play a large part in sales from now on.

Imports of Crude Rubber into the United States during July of this year exceeded those of July, 1923, by 1,360 tons. Total imports for last month were 19,969 tons, of which 18,390 tons were plantations. Imports for the seven months ended July 31st, however, were 174,785 tons as against 208,618 tons for the same period in 1923, a decrease of 16 per cent.

On the 1st following a further cut in the exportable allowance a one half cent premium was established between August and October/December the latter quoted at 24c. September sold in a fair quantity way to factories at 23⅜c with the majority of interest during the day centered on this and the Oct./Dec. position. London showed an advance of 1/8d closing firm at 12½d buyers, with Singapore remaining unchanged throughout the day. On the 3rd and 4th, with the foreign centers closed by the Bank holidays, the local market continued to advance independently, with the nearby position held at 24⅛c on the latter date while Oct./Dec. was firmly held by sellers at 24⅝c. Heavy buying on the part of consumers and covering by short interests took place over the week-end.

On the 6th the London market opened strong at 13-1/8d due to a higher exchange rate and the independent advance of this market. Local prices reached the 25c level with business done at this price. On the 7th an advance of 2c featured the market with tremendous activity taking place. Manufacturers entered the fray without hesitation throwing aside all previous caution and reserve and as a consequence a large amount of business was passed for their account at the new high levels. With 27¼c paid for the spot position the London market advanced 3/8d closing firm at 13-3/4d buyers. Singapore also showed a gain of ½d. The remainder of the week showed further gains with the nearby position selling in most directions at 27½c.

On the 13th and 14th a setback was encountered with prices easing off approximately two cents. This sharp decline however, is not regarded by the majority of the trade as a forerunner of lower prices, inasmuch as a decline usually occurs when the market assumes an upward trend to new high levels.

NEW YORK MARKET

Plantations—			
Ribbed Smoked Sheets.			
Spot	.25⅛	@	—
August	.25¼	@	—
August/September	.25¼	@	—
Oct.-Dec.	.25½	@	—
First Latex, crepe, spot	.26	@	—
Amber Crepe No. 1, spot	.25	@	—
" " No. 2,	.24¾	@	—
" " No. 3,	.24½	@	—
" " No. 4,	.24¼	@	—
Brown Crepe, Rolled	.23¾	@	—
" " Clean, thin	.24½	@	—
" " Specky	.24	@	—
Scrap, Colombo No. 1	.17½	@	—
Pontianac—			
Prime Pressed	.13½	@	—
Palembang	.08¼	@	—
Bangermassin	.07¾	@	—
Sarawak	.07½	@	—
Paras—			
Up-river Fine	.26	@	—
" Medium	.24	@	—
" Coarse	.18	@	—
Islands, fine	.22	@	—
" medium	.21½	@	—
" coarse	.14½	@	—
Cameta	.16	@	—
Madeira Fine	.27½	@	—
Acre Bolivian, fine	.27	@	—
Cut Beni Bolivian, fine	.26	@	—
Tapajos, fine	.24¾	@	—
Xingu Ball	.15¼	@	—
Caucho Ball—			
Upper, shipment	.18	@	—
Centrals—			
Central, scrap, prime	.16¼	@	—
Corinto, scrap	.16¼	@	—
Esmeralda, sausage	.16¼	@	—
Guayule, w and d	.24	@	—
Africans—			
Benezuela, No. 1	.14	@	—
" No. 2	.13	@	—
Congo, upper, black	.20	@	—
" " red	.19	@	—
Kassai, Prime Red	.19	@	—
Balata—			
Black, Columbia	.49	@	.51
" Cuidad	.62	@	.63
Surinam, sheet	.73	@	.75
Gutta Percha—			
Siak	.18¼	@	—
Red Macassar	2.80	@	3.00
Chicle—			
Mexican, Yucatan	.64	@	.65

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	13 d
September	13
Oct.-Dec.	13¼ @
Jan.-Mar.	13½

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	12½ d
September	12⅝
Oct.-Dec.	12¾
Jan.-Mar.	13

Reclaimed Rubber

NEW YORK, August 15, 1924

No improvement in the reclaimed market is noted over the last two weeks. Prices remain nominally unchanged in most instances from quotations in our last issue. Reports from various reclaimers state that this is one of the worst years from the standpoint of business placed and with buyers showing little interest in the market, reclaimers are forced to keep prices at the present low levels which in many cases necessitate selling at a loss.

Floating Tube	.13	@	.13½
Friction, uncured	.21	@	.22
Boots and Shoes (unwashed)	.09	@	.09¼
Boots and Shoes (washed)	.12½	@	.13
Mechanical	.09	@	.09½
Hose	.09½	@	.10
Tires, truck	.07⅝	@	.08
Tires, auto, black	.09	@	.09½
Black (washed)	.10	@	.10½
White	.13¼	@	.13¾
Dark Gray	.09¼	@	—
Light Gray	.10¾	@	—

Scrap Rubber

NEW YORK, August 15, 1924

An advance in prices together with a steady demand on the part of consumers has featured this market for the past ten days. The recent advance in crude rubber has been the chief factor in placing prices for scrap at the present levels and higher quotations are looked for by dealers in this trade if crude continues on its upward trend. Inasmuch as this period of the year is usually rather inactive, the recent activity in this market has been greatly encouraging to dealers and the general opinion is that the fall months will see still further improvement both in prices and consumption.

Auto tire peelings	.01	@	.01¼
Standard White auto ton	20.00	@	22.00
Mixed auto ton	12.00	@	14.00
Bicycle tires ton	8.00	@	9.00
Clean solid truck tires	.01¼	@	.01½
Boots and shoes	.02¼	@	.02½
Arctics, untrimmed	.01	@	.01¼
Arctics, trimmed	.01⅜	@	.01⅝
Inner tubes, No. 1	.04	@	.04¼
Inner tubes, compounded	.02¼	@	.02½
Inner tubes, red	.02	@	.02¼
Battery jars, clean hard rubber	.02¼	@	.02½
Air Brake Hose ton	10.00	@	11.00
Rubber Hose ton	7.00	@	8.00

Chemicals

Acetone—An advance of one cent in price has featured this market during the past week with 16c per pound in car lots asked by sellers in most directions. Acetate of lime acetone also showed an advance to 17c per pound in car lots due to an exceptional demand for this item.

Barium Products—Dealers report having done a large volume of business in these grades during the past ten days and in many instances were forced to turn away business because of their inability to fulfill further orders. With the tone of the market firm sellers are quoting $90. to $95. per ton at works, while carbonate coming in for less demand is obtainable at $65. and $66. per ton.

Cotton Markets

(Continued on Page 389)

Ducks—During the week ending August 2nd the market assumed a quiet tone with only a small volume of business passed for the account of manufacturers. Many houses in the trade compared the trend of the market with the period preceding the advance in cotton, at which time hand-to-mouth buying was rampant. During the past week, however, a resumption in activity has been noted, and while the numerous orders placed, were in most cases for small sized quantities, the trade as a whole is inclined to be more optimistic. With prices on nearly all the grades showing a slight advance consumers feel justified in limiting their commitments, and in addition manufacturers are still inclined to be uncertain about the amount of business they will do in the future. Belting and hose duck has come in for considerable interest of late with mills reporting to have passed sales for large sized quantities at 46c and 46½c.

Burlaps—This market has maintained over the last ten days a steady tone with the primary markets well held. On the 1st and 2nd prices abroad noted an advance with lights up 10d and heavies 13d, but on the 5th the market for the first time in days reported lower quotations due to previous heavy trading. On the 8th with Sterling showing a strong tendency shipment quotations advanced with 10½s up 15 points and 8s up 25 points.

SHEETINGS				
40-inch	2.50-yard	yd.	.17 @	—
40-inch	2.85-yard	yd.	.15 @	—
40-inch	3.15-yard	yd.	15 @	—
40-inch	3.60-yard	yd.	.12½ @	—
40-inch	3.75-yard	yd.	.11½ @	.11¾
40-inch	4.25-yard	yd.	.10¼ @	.10¾
DUCKS				
Belting		lb.	.46½ @	—
Hose		lb.	.46½ @	—
Enameling		lb.	.48 @	.52
Shoe Ducks		lb.	.52 @	.54
Single filling			.21½ @	.23
Double filling		lb.	.24 @	.25
BURLAPS (Carload Lots)				
7½-ounce	40-inch		7.05 @	—
8 -ounce	40-inch		7.15 @	—
10 -ounce	40-inch		9.90 @	—
10½-ounce	40-inch		10.25 @	—
DRILLS				
37-inch	2.75-yard	yd.	.15¼ @	.15½
37-inch	3.00-yard	yd.	.14¼ @	.14½
37-inch	3.25-yard	yd.	.13¼ @	.13½
37-inch	3.50-yard	yd.	.12¼ @	.12½
37-inch	3.95-yard	yd.	.10¼ @	—
OSNABURGS				
30-inch	7-ounce		.15½ @	.15⅝
40-inch	7-ounce		.17 @	.17¼

Rubber Patents

JULY 29, 1924

1,502,704. Safety tire valve. Hiram N. Wilson, Omaha, Neb., assignor to Henry M. Wilson, Omaha, Neb.

1,502,740. Dust cap for tire valves. Eugene V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,503,113. Process for vulcanizing rubber with condensation products of ammonia and aldehydes as accelerators. Sidney M. Caldwell, Leonia, N. J., assignor to Naugatuck Chemical Co.

1,503,225. Tire removing machine. Maurice Peter Breon, Newport News, Va., assignor to Cora Louise Breon, Newport News, Va.

1,503,265. Tire protector. Barney Goldman, New York, N. Y.

1,503,429. Process of accelerating the vulcanization of natural or artificial india rubber or rubberlike substances. William Fraser Russell, Norwalk, Conn., assignor to the Norwalk Tire & Rubber Co., Norwalk, Conn.

1,503,430. Art of vulcanizing rubber. William Fraser Russell, Norwalk, Conn., assignor to the Norwalk Tire & Rubber Co., Norwalk, Conn.

1,503,432. Method of vulcanizing self-cooling tires. Kuno Schragin, Berlin, Germany.

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1,503,466. Overshoe for tires. Herbert S. Bennett, Jamestown, N. Y.

1,503,665. Method of an apparatus for making annular sheets of rubber. Fred Thomas Roberts, Cleveland, Ohio.

1,503,667. Method of making hollow rubber articles. William E. Roberts, Andover, Mass.

1,503,701. Patch and method of making the same. Harold A. Morten and Marion M. Harrison, Akron, Ohio, assignors to the Miller Rubber Co., Akron, Ohio.

1,503,702. Rubber vulcanization and product thereof. Harold A. Morton, Akron, Ohio.

1,503,764. Cushioned shoe. William H. Nickerson, Brookline, Mass.

1,503,798. Tube-vulcanizing device. Joseph G. Moomy, Erie, Pa., assignor to Mary H. Moomy, Erie, Pa.

1,503,883. Ring for tire beads. Henry Z. Cobb, New York, N. Y., assignor to Morgan & Wright.

1,503,976. Wheel rim and pneumatic-tire cover. John Walters Bryant, Shepparton, Victoria, Australia, assignor of one-twelfth to Charles William Bryant, one-twelfth to Charles Willliam Bryant, one-twelfth to Charles James Bryant, one-sixth to Margaret Eliza Bryant, and one-sixth to William Sheil, all of Shepparton, Victoria, Australia.

1,504,079. Inflatable sheet-rubber toy. Fred Thomas Roberts, Yonkers, N. Y., assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, N. Y.

1,504,110. Resilient wheel. Charles F. Erickson, Brooklyn, N. Y.

1,504,130. Manufacture of solid rubber tires. Colin Macbeth and Harry Willshaw, Birmingham, England, assignors to Dunlop Rubber Co., Ltd., London, Eng.

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1,504,255. Method of manufacturing bias fabric and apparatus therefor. Frank J. MacDonald, Akron, Ohio, assignor to the Firestone Tire & Rubber Co., Akron, Ohio.

1,504,313. Resilient road surface, flooring and the like. William Francis Barns, Ipoh, Perak, Federated Malay States.

1,504,449. Solid tire. Albert Hargraves, Akron, Ohio, assignor to the Firestone Tire & Rubber Co., Akron, Ohio.

1,504,547. Process of molding hollow articles. Henry C. Egerton, Ridgewood, N. J.

1,504,653. Method of making annular tubes. Edward C. Taylor, Springfield, Mass., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,504,694. Vehicle tire. Paul W. Litchfield, Akron, Ohio, assignor to the Goodyear Tire & Rubber Co., Akron, Ohio.

1,504,728. Cord-tire-building machine. Knut O. B. Textorius, New York, N. Y., assignor to Tex Engineering Corp., New York, N. Y.

1,504,729. Tire-building-machine. Roland S. Trogner, Akron, Ohio, assignor to the Goodyear Tire & Rubber Co., Akron, Ohio.

1,504,745. Tire patch and pump. Joseph De Fabrio and Robert M. Banks, Bridgeport, Conn.

1,504,806. Resilient wheel. Edward J. Brandt, Watertown, Wis.

1,505,038. Rubber heel. Charles William Lavers, Halifax, Nova Scotia, Canada.

New Incorporations

COLORADO

The Ora Rubber Products Co. Capital $25,000. Incorporators: Charles Ora, W. I. Greenlee, W. L. Smith and others. Principal office, Denver, Col.

MASSACHUSETTS

Nelson-Phillips Manufacturing Co. $30,000; 300 shares of $100 each. To deal in rubber, cotton, silk, woolens, etc. Incorporators: Morris Goralnik, president; Jacob Goralnik, vice president; Nathan Dashoff, treasurer. Principal office, Fall River, Mass.

NEW YORK

Wienard Rubber Co., Inc. Capital $20,000 in $100 shares. To manufacture rubber goods. Incorporators, Samuel S. Multer, Charles Bornheim and I. J. Solomon. Principal office, New York, N. Y.

Bancroft W. Henderson & Co., Inc. Capital 100 shares of no par value To deal in crude rubber. Incorporators, Beatrice Tow, Bertha Prince and N. T. Weiss. Principal office, New York, N. Y.

OHIO

The Utility Tire & Rubber Co. Capital $50,000. To manufacture and sell automobile tires and tubes. Incorporators, R. E. Helm, W. G. Miles, H. S. Young, R. E. Happoldt and Guy J. Zimmerman. Principal office, 1292 South Main St., Akron, Ohio.

Trade Marks

JULY 29, 1924

(Subject to opposition within 30 days of above date)

"PROTEX"—No. 176,018. The Fair, Chicago, Ill. Sanitary belts, sanitary aprons, sanitary bloomers, rubber hot-water bottles and rubber fountain syringes.

D—No. 196,956. The Goodyear Tire & Rubber Co., Akron, Ohio. Golf balls.

CRITERION—No. 196,964. National Tire & Rubber Co., East Palestine, Ohio. Tires and tubes.

CORDUROY—No. 197,417. Corduroy Tire Co., Grand Rapids, Mich. Pneumatic rubber tires and inner tubes therefor.

UNIVERSAL—No. 197,560. Karl W. P. Reece, Boston, Mass. Rubber jar rings.

SECRETEX—No. 197,759. Charles B. Johnes, Newark, N. J. Piece goods made partly of rubber.

RED TOP—No. 197,782. Seamless Rubber Co., Inc., New Haven, Conn. Stemless rubber bladders used in footballs, striking bags, basket balls, volley or soccer balls.

MUSKETEER—No. 197,864. Champion Rubber Co., Kent, Ohio. Rubber tires and tubes.

AUGUST 5, 1924

(Subject to opposition within 30 days of above date)

DESIGN (consisting of the representation of a bull dog, the title and address of the company, the words "bull dog belt," etc.)—No. 162,374. Boston Woven Hose & Rubber Co., Cambridge, Mass. Rubber belting, stitched canvas belting, rubber packing, rubber or rubber and fabric hose, rubber or rubber and fabric tires, rubber tubing and fruit-jar rings.

DESIGN (consisting of a circle containing the letter "A")—No. 180,261. American Rubber & Tire Co., Akron, Ohio. Resilient vehicle tires and inner tubes of rubber or rubber and fabric.

REVELATION—No. 193,920. Hamilton Rubber Mfg. Co., Trenton, N. J. Belting made of rubber and of a combination of cotton rubber duck with rubber impregnation and rubber cover; air hose made of rubber and of a combination of cotton rubber duck with rubber impregnation and rubber cover.

B—No. 196,804. Goodyear Tire & Rubber Co., Akron, Ohio. Golf balls.

C—No. 196,861. Goodyear Tire & Rubber Co., Akron, Ohio. Golf balls.

(Not subject to opposition)

EVER-WEAR—No. 187,670. Richard Falter, doing business as Richard Falter Co., New York, N. Y. Rubberized and waterproof sheeting and crib sheets.

AUGUST 12, 1924

(Subject to opposition within 30 days of above date)

DESIGN (consisting of a shaded figure containing the words "The Walker Shoe for Men"—No. 197,787. Walker Shoe Co., Cincinnati, Ohio. Shoes made of leather, rubber, fabric or any combination of the same.

WARRIOR—No. 198,876. Mohawk Rubber Co., Akron, Ohio. Resilient vehicle tires and inner tubes of rubber or rubber and fabric.

DESIGN (consisting of the letter "M," shaded between the lines)—No. 198,877. Mohawk Rubber Co., Akron, Ohio. Resilient vehicle tires and inner tubes of rubber or rubber and fabric.

(Not subject to opposition)

GREENE'S—No. 188,011. Irving Berlin, Inc., doing business as Greene's, Chicago, Ill. Ladies wearing apparel including leather, rubber and fabric shoes.

THE MARKET PLACE

on the page opposite may be consulted freely as only the names of reputable firms appear there.